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**THE OPEN UNIVERSITY**

**BUSINESS SCHOOL**

**PhD Thesis**

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**BSc. Honours (Economics)**

**MSc. (Economics)**

**MSc. (Business and Management Research Methods)**

**Market for Corporate Control and European Utilities**

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## Abstract

Mergers and acquisitions of European utility sectors subsequent to privatisation and deregulation triggered widespread concern. This is primarily due to the crucial role played by utility sectors in a country's economic and social development for being providers of essential services. The general political consensus is that the utility sectors should be economically regulated. So there is limited scope for the investors in utility sectors to earn supernormal profits. This calls for a need to examine whether M&A of utilities create value for the shareholders. In addition given the continuing trend of M&A in European utility sectors it is also vital to understand the motives behind such large scale M&A in utility sectors. So the objective of this thesis is to examine the causes and consequences of M&A in European utility sectors from a finance theory perspective.

From the study of a sample of 156 cases of M&A within utility sectors in Europe between 1990 and 2006 this thesis provide mixed evidence on the performance of utility sectors following M&A. On one hand the findings suggest that economic regulation of utilities acted as a good safeguard for the utility sectors from suffering losses following M&A. This is evidenced from the lower level of losses accrued to the acquirer shareholders. Evidence of synergy motive behind M&A of European utility sectors also suggests that effective regulation prevented M&A of utilities that are not motivated by synergy. From an economic policy perspective this result bears important policy implications as it suggests that M&A in utility sectors should be passed through effective regulatory scrutiny. On the other hand the fact that acquirer shareholders in the short run and the combined shareholders in the long run have suffered losses triggers a negative signal for the investors in utilities. This also has policy implications as it suggests that investors should be careful to adopt the strategy of M&A.

This thesis also finds that the short run changes in shareholder returns are not explained by any explanatory variables. However in the long run post merger period the shareholder returns of the utility companies that were subject to privatisation earned higher returns compared to those firms which were in private sector since their inception. One likely reason for this outcome is that privatisation has led to increase in efficiency of the utility companies as reported by the extant studies. In addition evidence from this thesis indicates that in the initial post merger period the shareholders under cross-border M&A faced some barriers to entry but as the length of the post merger period increased they had overcome these barriers to entry in a foreign land.

Taken together this thesis provides significant contribution both in the area of research on utility sectors as well as finance literature on M&A.

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# Chapter 1

## Motivation, Objectives and Outline of the Thesis

*“When we deal with great public services like electricity which affect every home, business and industry in the country, governments must be sure beyond doubt that their actions are beneficial to all the people of the country and not just to a sectional interest.....electricity, gas, water and telecommunications are great and essential public services. It will be a bad day for Britain if they fall into the hands of remote and inaccessible managers whose eyes are mainly fixed on making a profit”.*

Lord Cledwyn of Penrhos, speaking on Electricity Privatisation Proposals in the House of Lords, as quoted in Hansard, 20 May 1988.

### 1.0 Introduction

Since the widespread introduction of privatisation as a tool of central government policy in the mid-1980s, changing ownership of utilities has provoked considerable concern both in the UK and the rest of Europe. This is largely due to the centrality of the utility sectors at the heart of the social and economic life of a country as demonstrated in the above quote.

Utilities are essential services that play a vital role in economic and social development and they are expected to serve the public interest whether they are provided publicly or privately. No other sectors are so involved in the day-to-day life of all citizens while simultaneously being a key player for a country's economic

wellbeing. Utility sectors are also capital intensive and involve huge investment (Armstrong et al, 1994). Moreover these sectors constitute a major share of a country's GDP (Coen and Doyle, 2000). About 20 percent of household consumption expenditures in Europe are comprised of expenditures on utilities (Eurostat Yearbook, 2009, p.6). These are strategic industries whose role in the wider economy cannot be overstated.

In addition utility sectors are also guided by social welfare considerations. So the state has an obligation to ascertain reliable universal access and continuity of service under transparent and accountable regulatory frameworks (Armstrong et al., 1994). All these factors contribute towards a need to fully understand all strategic and financial mechanisms associated with these industries, and the potential impact that any change in ownership can have upon performance, from financial, strategic and economic viewpoint. Hence study of these sectors requires serious consideration.

Increased competition and globalization in the utility sectors in recent years has forced changes in regulatory frameworks, ownership structures and diversification of businesses of these companies. In Europe utility sectors were subject to privatisation, liberalisation and deregulation in the early 1990s. Deregulation was introduced in order to curb utility sectors from using their monopoly power and to promote competition. Deregulation of these sectors might be politically motivated as distribution of gains is a sensitive issue (Coen and Doyle, 2000). Hence the policy of privatisation, liberalisation and deregulation of utilities by the governments across different countries in Europe has been subjected to extensive public policy debate (Jones, 2001).

One of the consequences of privatisation of utilities was that it created the market for corporate control<sup>1</sup>. Europe-wide regulatory reforms and the creation of markets for services as well as markets for corporate control created a dynamic market environment in different utility sectors. As a response to this deregulation utility sectors in Europe embarked on mergers and acquisitions<sup>2</sup> (M&A) on a significant scale (Nestor, 2005).

Mergers and acquisitions is a mechanism by which two companies are combined to achieve certain objectives. There is a multitude of business and academic studies that have examined M&A over the last two decades. But most of these studies have found little definitive evidence that these deals create value. In fact as Bruner (2002) documented only 20 percent of mergers have increased shareholders' returns and most mergers typically erode shareholders' wealth. Despite this fact industries across the globe continue to grow, consolidate and restructure through M&A.

The M&A activity in European utility sectors started in the early 1990s but it peaked from the mid to late 1990s. I will discuss the reason for this trend in M&A further in Section 1.1 below. In fact the M&A data on utilities revealed that the total value of utility deals from 1990 to 2006 was 12 percent of total value of M&A deals in Europe (SDC Mergers and Acquisitions database).

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<sup>1</sup> The market for corporate control is an extension of free market in products and services to a free market in corporations (Sudarsanam, 2003, p.55).

<sup>2</sup> The definition of merger, acquisition, and takeover following Sudarsanam (2003, p.2) is given as follows. In a merger two companies come together and share their resources to achieve certain objectives. In an acquisition the acquirer firm purchases the assets or shares of the target firm such that the shareholders of the target firm cease to be the owners of that firm. A takeover is a specific form of acquisition where the acquirer is much larger than the target. So while in a merger a new entity is formed in an acquisition the target firms become a subsidiary of the acquirer firm. In this thesis the term M&A will be used to refer to any strategic decision of mergers, acquisitions or takeovers.



Several reasons behind these M&A of European utility sectors have been put forward. For instance according to Financial Times (December, 28, 2009) *“The wave of consolidation in the utility sector in Europe through the decade was driven as much by a political imperative to create strong national champions as by any sound industrial logic”*. Moreover it has also been argued that given the small size of many European markets, mergers outside the national boundaries would allow the utility companies to become a significant player in the utilities market and thereby remain competitive (Global Energy Business, 2001). In addition generation of economies of scale is also deemed to be another important factor behind consolidations in European utility sectors (Becker-Blease et al, 2008).

The M&A of European utility sectors raises some important issues that help explain my interest in this area. First the general political consensus is that utility sectors should generate a stable rate of return. This is because the regulators of utilities would tend to keep prices down so that these essential services can reach to customers at affordable prices. So there is limited scope for the investors in utility sectors to earn supernormal profits by engaging in M&A. Hence the question that arises is whether M&A of utilities create value for the shareholders. Second as utility sectors are indispensable and bear significant social welfare characteristics, so it is vital to examine whether the market's perception of M&A within such sectors is any different from that in non-regulated industries<sup>3</sup>. Third, there was a surge of M&A in utilities across Europe which started in the mid 1990s (following the removal of golden shares). This is the first time when utility sectors in Europe, as a response to

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<sup>3</sup> All companies are subjected to some form of regulation. Here non-regulated industries refer to those industries that are not subjected to any economic regulation like price-cap regulation in the UK and rate of return regulation in the US in the context of utility sectors.



deregulation embarked in M&A on such a significant scale. Therefore it is also important to understand the reasons behind such large scale M&A in utility sectors. Moreover the continuing trend of M&A of European utility sectors also makes it timely to examine the M&A in these sectors.

The aim of this thesis is to determine the causes and consequences of M&A in European utility sectors from a finance theory perspective<sup>4</sup>. In particular this thesis will examine whether the erosion of shareholder wealth as reported by most M&A studies in non-regulated industries also holds true for M&A of European utility sectors. This thesis also intends to study the determinants of shareholder returns and the motives behind M&A of European utilities.

The rest of the Chapter is structured as follows. Section 1.1 documents the characteristics of utility sectors and the privatisation, liberalisation and deregulation activity that were witnessed by these sectors in Europe. Section 1.2 discusses the different theories and rationales behind M&A. Section 1.3 documents the motivation and objectives of this research. Section 1.4 reviews the research questions and provides an outline of the chosen methods. In Section 1.5 I present the contribution of this thesis. Finally Section 1.6 provides an outline of the thesis.

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<sup>4</sup> I shall elaborate on this further in Section 1.2.

## **1.1 Utility sectors in Europe**

In this Section I will briefly discuss the distinct characteristics of utility sectors and highlight the significant changes that have taken place in these sectors in Europe prior to their embarking in M&A.

### ***1.1.1 Characteristics of utility sectors***

Utility sectors are marked by some distinct economic characteristics (Vickers and Yarrow, 1988; Armstrong et al, 1994). Most of these sectors supply their end product through a fixed network and are often labelled as network industries. Therefore some aspects of these sectors like transmission and distribution have natural monopoly conditions. This is because the costs of wires (for fixed line telephones and electricity) and pipelines (for gas and water) are sunk costs and it would be inefficient to have competing networks. Moreover duplication of these networks would be a wasteful expenditure for the economy (Armstrong et al, 1994). Furthermore since utility sectors provide essential services so their demand is very low price elastic. All of these factors make utility sectors quite distinct from any other sectors. Hence these sectors need to be studied separately.

### ***1.1.2 Privatisation, regulation and introduction of competition***

The UK pioneered the privatisation process of utility sectors in Europe by first privatising British Telecom in 1984. Subsequently continental European countries like

Italy, Spain, France and Portugal also engaged in large-scale privatisation programmes in the 1990s (Parker, 2003).

The privatisation of utilities in the UK and continental Europe was accompanied by deregulation and the introduction of competition. Proponents of privatisation believed that competition would work as an incentive mechanism to promote productive and technical efficiency as well as allocative efficiency. The theory of contestable markets postulated that competition would have a disciplining effect on the incumbent utility firm (Yarrow, 1986, Baumol and Willig, 1986 cited in Vickers and Yarrow, 1988). However it has also been argued that strategic entry deterrence by dominant incumbent firms could prevent effective competition (Vickers and Yarrow, 1988). Therefore it was accepted by policy makers that liberalisation should be accompanied by regulation in order to benefit from competition but at the same time to protect consumers (Vickers and Yarrow, 1988).

The role of regulation is to create a balance between the interests of the producers and the consumers (Parker, 2003). The regulator needs to guarantee that services are universal and affordable (Coen and Doyle, 2000). So as discussed earlier regulation is likely to be politically charged as views about competition and structures of regulation differ across political parties and other vested interests.

In the UK all utility companies were subjected to price cap regulation<sup>5</sup>. In continental Europe utility sectors are regulated in accordance to the new Utilities Directive that was adopted by the EU Council of Ministers and the European Parliament in 2004 (Coen and Doyle, 2000). This encompassed the utility regulation in all the EU countries. The deregulation of utility sectors in Europe led to major restructuring of these sectors. As a part of this restructuring activity several utility companies adopted a strategy of acquiring other utility companies.

### ***1.1.3 Mergers and Acquisitions of utilities in Europe***

After the liberalisation and deregulation of utilities market in the UK and continental Europe the governments in most European countries retained some control over utility companies by holding golden shares in the privatised companies. Under the principle of golden shares the government had a right of veto in case of a post-privatisation transfer of control by shareholders (Dnes et al, 1998; Nestor, 2005). The golden shares principle therefore limited the possibility of M&A in European utility sectors. In the UK and in continental Europe the golden shares were abolished in 1995 and 2002 respectively (Dnes et al, 1998; Nestor, 2005). Direct state controls on European utility sectors were therefore removed. This allowed the utility sectors in Europe to adopt the strategy of M&A. The utility sectors subsequently witnessed a significant number of M&A. Hence although the M&A in European utility sectors started in the

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<sup>5</sup> Under price cap regulation utility sectors can make any changes in its price provided that the average price of a specified basket of its goods and services does not increase faster than  $RPI - X$ , where  $RPI$  is the Retail Price Index (i.e., the rate of inflation) and  $X$  is an expected increase in efficiency that this sector is expected to achieve.  $X$  is specified by the government or regulatory body for a specified period of four to five years. At the end of the specified period, the level of  $X$  is reset by the regulator and the process is repeated (Beesley and Littlechild, 1989).



early 1990s the M&A activity accelerated in the mid to late 1990s after the removal of golden shares.

## **1.2 Theory and rationale behind M&A**

The M&A literature provide different rationales behind mergers. For instance mergers might occur in order to gain competitive advantage through reduction of costs or increase in market power. Cost reduction can take place through economies of scale and scope (Andrade et al, 2001). There are also strategic motives where M&A might be motivated to acquire products, technologies and businesses that complement core competencies (Sudarsanam, 2003, p.47). Other rationales behind M&A are to bring about market discipline leading to the removal of incompetent management in target companies, and diversification motives (Andrade et al, 2001).

Some M&A literature also considers the merger decisions of firms within the framework of its various financial stakeholders, their different motivations and conflict of interests. These M&A studies are broadly classified as having a finance theory perspective on M&A. The aim of this thesis is to focus on M&A of European utility sectors from a finance theory perspective.

Specifically the finance literature on M&A examines the change in shareholder wealth creation following M&A. Since the shareholders are the residual owners of the company so examination of shareholders' wealth provides an effective evaluation criterion (Martynova and Renneboog, 2008). Finance theory applied to M&A also rests on the conflict of interest between principals (shareholders) and agents



(managers), and in particular what is known as agency problems (Sudarsanam, 2003, p.52). Agency problems refer to situations where managers pursue their own interests at the cost of the interests of the shareholders. In particular where M&A are motivated by agency, the acquirer managers embark in M&A to maximise their own welfare at the cost of the acquirer shareholders.

Two other motives behind M&A have also been identified (Goergen and Renneboog, 2004). These are synergy and hubris. The synergy hypothesis suggests that M&A takes place due to the economic gains that emanate from merging the resources of two firms. The hubris hypothesis suggests that acquirer managers make mistakes in evaluating the target firms and undertake M&A presuming that their valuation of the target firm is correct. So under hubris, M&A take place due to the overconfidence of the acquirer managers in assessing the potential synergy from an acquisition. The number of studies that have examined the motives behind M&A are few and all of these studies are based on non-regulated industries (Berkovitch and Narayanan, 1993; Seth et al, 2000 and Goergen and Renneboog, 2004).

Given these different rationales and hypotheses behind M&A, in Section 1.3 I will present my hypotheses surrounding M&A of European utility sectors and in doing so I will outline the motivation and objective of this research.

### **1.3 M&A of European utilities - Motivation and objectives of this research**

Privatisation, liberalisation and deregulation are policy-driven interventions that have taken place in European utility sectors. These structural changes have brought utility

sectors into the hands of the market forces. Following any industry shock<sup>6</sup> the market has a natural tendency to restructure and consolidate in order to have a more efficient allocation of resources (Becker-Blease et al, 2008). In fact some studies like Mitchell and Mulherin (1996) and Andrade et al (2001) have documented that mergers strongly cluster by industry as a response to industry shock. In addition Andrade et al (2001) indicated that the M&A of the 1990s were largely due to the result of deregulation. Hence following these studies it can be deduced that the significant surge of M&A in European utility sectors since the mid 1990s is an industry shock caused by deregulation.

M&A in both regulated and non-regulated industries need to pass the hurdle of getting approval from the competition authorities. In Europe the European Community Merger Regulation (ECMR) which came into effect in 1990 is responsible for approving all M&A (Sudarsnam, 2003, p.416). In addition the UK has its own M&A regulatory bodies which are the Office of Fair Trade and the Competition Commission. But M&A in economically regulated sectors like utilities require further approval from the specific regulators of these sectors. In fact getting regulatory approval for M&A is one of the largest uncertainties and risks that are faced by utility sectors. This clearly affects the economics of any deal (Boston Consulting Group, 2007).

One of the key objectives of privatisation and deregulation was to promote competition (Armstrong et al, 1994; Parker, 2003). However consolidation of utilities can shift the market power in the hands of a few large utility companies. Therefore

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<sup>6</sup>Mitchell and Mulherin (1996) attribute industry shocks to any exogenous changes that lead to alterations in industry structure.

following M&A, the utilities market may well shift from a competitive market to an oligopolistic one. Given the importance attached to utility sectors such deviations from competitive market structure might prove detrimental for the society in general and the consumers in particular. Hence regulators of utilities are very careful in approving mergers as it might prove to be anticompetitive. This point has also been raised by Leggio and Lien (2000) in the context of the US electricity sector. Moreover since the role of the regulator is to balance the interests of the producers and consumers, so the regulators through their actions would aim to prevent the investors in utilities from earning supernormal profits.

Existing research however does not provide any evidence as to whether this requirement for regulatory approval has acted as an impediment towards value creation from M&A in utility sectors. So, given the increasing number of M&A that have taken place in European utility sectors following deregulation it is imperative to examine whether these M&A have proved to be value enhancing for the investors. This result will have important implications from an academic, an investment and a policy standpoint.

M&A research has attracted the attention of researchers for a long time. However there is little empirical evidence of M&A in utility sectors. The data based on my sample selection consist of 156 utility companies in European utility sectors from 1990 to 2006<sup>7</sup> (Thomson SDC database). With the significant rise of M&A in utility sectors following deregulation, several studies have attempted to examine various aspects of M&A in these sectors. I have reviewed these studies in Section 2.2 of

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<sup>7</sup> The criterion for sample selection is described in Section 4.3 of Chapter 4.

Chapter 2. However this existing body of literature does not answer a fundamental question of interest; what are the causes behind these M&A? This thesis examines the motives of utility sectors behind adopting an M&A strategy. It is also appropriate to address this question given the growing trend of M&A in utility sectors since the mid 1990s.

These M&A also have significant economic importance - the value of some of these M&A deals in utility sectors has been substantial. For instance, the data from my sample reveal that in 1999, U.K.'s Vodafone acquired Germany's Mannesmann for \$200bn<sup>8</sup>. This is so far the largest M&A deal in Europe not only in utility sectors but also taking all other sectors into consideration (Sudarsanam, 2003, p. 1). Some other prominent M&A in European utility sectors in terms of deal size as evidenced in my sample are the merger between Vodafone of the UK and Airtouch Communications of the US for \$67 billion; merger between Viag and Veba of Germany in 1999 to form Eon (deal value \$14 billion) and the acquisition of Scottish Power of the U.K. by Iberdrola of Spain in 2006 (deal value \$26 billion). Given the size of some of these M&A deals in utilities one issue that arises is whether this M&A will lead to an increase in shareholder value.

The integration of the national markets towards a single European market also made it possible for utility firms in Europe to embark on both domestic and cross-border M&A following deregulation. *"The extent of M&A activity indicates that European utilities are keen to gain a niche in other markets, whether it be by acquiring a new business at home, or expanding operations abroad"*

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<sup>8</sup> The data on deal value is obtained from SDC Mergers and Acquisitions Database.



(<http://www.globalbusinessinsights.com/content/rben0134m.pdf>; 26<sup>th</sup> May, 2010).

From this quote it is apparent that M&A of utility sectors following deregulation included a rise in both related as well as diversified M&A.

In addition ABS Energy Research (2006)<sup>9</sup> has shown that the level of deregulation in different utility sectors across Europe is different. This is also evident from the following quote. *“For more than a decade the European Commission has been trying to enable energy producers and distributors to compete freely across national borders. The final deadline of the EU's bulky legislative programme to liberalise the market is July 2007. By then member states are supposed to have implemented all EU energy directives”* (The Economist, December 2, 2006). Given these different characteristics associated with M&A in European utility sectors this thesis aims to examine whether these different deal characteristics have an impact on value creation following M&A.

The issues surrounding the M&A of European utility sectors that I have discussed in this Section along with the growing trend for European utility sectors to adopt the strategy of M&A are the motivation behind this research. Therefore as indicated earlier in Section 1.0 the objective of this research is to address the causes and consequences of M&A in European utility sectors. I now present in Section 1.4 the specific research questions that this thesis aims to study.

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<sup>9</sup> For a detailed overview of the level of deregulation activity in different utility sectors please see Table 4.3 of Chapter 4.



## **1.4 Research questions and outline of the chosen methods**

Due to the importance attached to utility sectors as a consequence of their economic regulation and social welfare characteristics, research in these sectors has attracted attention from various sides. Hence theoretical and empirical studies on utilities are diverse. But only a few of these studies have examined M&A that took place in European utility sectors subsequent to deregulation.

The literature related to M&A of European utility sectors is informative. However most of these studies have focused on M&A in electric utility sector. In addition all of these studies are country specific. For instance Ghobadian et al (1999) and Ghobadian and Viney (2000) have examined M&A in the U.K. electricity sector. Freytag et al (2005) have examined M&A in the German energy market. Clearly there is a lack of evidence of M&A across all utility sectors in Europe. In addition deregulation and subsequent M&A in utility sectors has taken place almost simultaneously in all utility sectors across Europe. So it would be extremely timely to undertake a comprehensive analysis of M&A across all utility sectors in Europe.

Moreover in Section 1.2 above I have outlined that finance theory on M&A rests on the value creation following M&A and the motives behind these M&A. However none of the previous literature on M&A of European utility sectors has attempted to examine the M&A of European utility sectors from a finance theory perspective. An objective of this thesis is to address this gap.

Specifically this thesis will examine whether deregulation allowed managers to pursue value-enhancing mergers. This thesis will also examine the motives behind utility sectors to implement the strategy of M&A. I will particularly examine the motives in the light of the three hypotheses on the motives behind M&A as postulated by the finance literature. These are synergy, agency and hubris.

Finally this thesis will also analyse whether value creation (or destruction) following M&A are related to some specific characteristics of M&A. In particular I will analyse whether the mergers created value for a diversified shareholder, whether domestic mergers created more value compared to cross-border mergers and whether privatisation and the level of deregulation has any impact on value creation following M&A. Furthermore this research will also explore the impact of acquirers' glamour status<sup>10</sup> and relative size of acquirer to target firm on shareholders' returns. A detailed discussion of the possible implications of these deal characteristics on shareholders' returns are discussed in Section 3.2 of Chapter 3.

The specific research pertaining to these objectives are given in Chapter 3. To address these objectives this thesis will examine the M&A that has taken place between European utility companies who had acquired other utility companies from 1990 to 2006. The reason behind examining a sample of M&A within utility industries is first to determine whether changes in shareholder wealth as reported by non-regulated industries also holds true for regulated utility sectors. A second reason behind this

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<sup>10</sup> The definition of glamour and value acquirers is given in Footnote 30 of Chapter 2.

sample selection is to examine whether the operational synergy<sup>11</sup> that is likely to emanate from these within industry mergers has actually taken place.

The rationale for inclusion of the sample period 1990 to 2006 is as follows. Since M&A of European utility sectors started as a response to market liberalisation and deregulation in the early 1990s therefore in this thesis I have taken the starting period of the sample year as 1990. In addition since this thesis has examined long run post merger returns 3 years following the completion of M&A therefore ending date of the sample has been taken as 2006 so that all the utility companies in the sample can be incorporated in the long run analyses.

### *Methodology to calculate shareholder wealth creation*

In this study I aim to examine the shareholder value creation following M&A both in the short run following the announcement of M&A as well as in the long run post acquisition period following the completion of M&A. The short run and the long run abnormal returns<sup>12</sup> will be examined using event study methodology. Market efficiency theory suggests that in an efficient capital market stock prices will incorporate any new information almost instantaneously, such that the stock price of a company at any time will reflect the market's best estimate (Fama, 1970).

The long run event study methodology will gauge the actual gains or losses accrued to the shareholders in the post acquisition period. Both the short run and long run

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<sup>11</sup> Source of operational synergy for this within industry merger is through economies of scale and scope. (Sudarsanam, 1996).

<sup>12</sup> The abnormal returns are the returns in excess of normal returns. The normal returns are the returns that the firms are expected to earn in the absence of an event. The normal returns are calculated with respect to some benchmark model. This has been discussed in details in Chapter 4.

analyses have been used by a number of studies in the finance discipline. The rationale behind applying these methods to determine shareholders' wealth creation following M&A is discussed in Section 4.2 of Chapter 4.

The event study methodology entails the calculation of abnormal returns accrued to the shareholders. In the short run I have analysed the abnormal returns for both the target and acquirer shareholders over a few days surrounding the announcement date. Various benchmark models that are popular in the existing empirical literature such as the *OLS* market model, the mean adjusted model and the world market model have been applied. Three different benchmark models have been employed in order to ensure the robustness of the abnormal returns across different model specifications.

In the long run post acquisition period the abnormal returns are analysed 1 to 3 years following the completion of M&A (Loughran and Vijh, 1997). Two different abnormal performance estimators have been applied. These are the Buy and Hold abnormal return (*BHAR*) and the Calendar time abnormal return estimators (*CTAR*).

#### *Methodology to examine the determinants of short run and the long run shareholder returns*

To examine the determinants of shareholder returns I will analyse two regression models each pertaining to the short run and long run shareholder returns. The objective of these regressions is to identify whether the different characteristics of the M&A deals can explain the change in shareholders' returns in the short run and long run following M&A.



Specifically the regression models will look into the short run and the long run abnormal returns with respect to six different characteristics of M&A. These six variables include privatisation, deregulation, degree of relatedness of utility mergers (for instance gas-electric merger or electric-electric merger), domestic versus cross-border M&A, the glamour status of the acquirers and relative size of acquirer to target firms. Detailed discussion of the hypotheses pertaining to the impact of these explanatory variables on shareholder returns is given in Chapter 3.

### *Methodology to examine the motives behind M&A*

The motives behind M&A of European utility sectors will be examined on the basis of three different hypotheses on the motives behind M&A as postulated in the finance literature. These are synergy, agency and hubris. This research intends to employ two different methods to examine the motives behind M&A of European utility sectors.

In the first method the motives will be examined by analysing the combined gains accrued to the shareholders of the target and acquirer firms in the short run following the announcement of M&A. In the second method the motives will be determined by the correlation between target gain and total gain and the correlation between target gain and acquirer gain. The purpose of applying this second method is to determine the simultaneous presence of two or more motives behind M&A. Both these methods have been applied by a number of studies in the context of M&A in non-regulated industries (Berkovitch and Narayanan, 1993; Seth et al, 2000; Goergen and Renneboog, 2004). A review of these studies can be found in Section 2.4 of Chapter 2.

## 1.5 Contribution to knowledge

This thesis offers the potential to make two major contributions to knowledge and a number of smaller contributions. It also has the potential to outline my future research agenda. *Firstly* this research represents an important contribution in the area of research on regulated sectors, and particularly the utility sectors. *Secondly* this research offers a key contribution in the field of M&A literature in finance.

The major contribution of this thesis lies in an empirical examination of M&A of European utility sectors from the finance theory perspective. From the literature survey conducted as part of this thesis, it appears that this is the only empirical study that provides a comprehensive analysis of M&A of European utility sectors by incorporating traditional finance methodologies.

A large body of empirical research on M&A is available in the area of finance. The bulk of these studies have examined M&A in non-regulated industries. Only a few of these studies are based on regulated utility sectors. There is, however, extensive research on the deregulation of European utility sectors. The reasons for so many studies on utility sectors is firstly due to the importance attached to these sectors as providers of essential services and secondly for contributing a major share of a country's GDP (Newbery, 1997). But none of these studies have particularly examined M&A in European utility sectors subsequent to deregulation. Therefore this research attempts to provide a comprehensive analysis on the causes and consequences of M&A in European utility sectors from the finance literature perspective.

From a methodological perspective, this research examines shareholder value creation following M&A both in the short run following the announcement of M&A and in the long run, following the completion of M&A within European utility sectors. This research therefore supplements the growing body of finance literature on long run post acquisition performance.

In addition, this thesis is one of the few M&A studies that uses a broad analytical framework to examine the motives behind M&A. Particularly in this study I use combined gains method and regression method to determine the motives behind M&A. This is the first study that analyses the motives in the context of M&A of regulatory sectors, and specifically utility sectors.

In order to understand the determinants or sources of short run and long run shareholder returns I conduct multiple regression analyses. This is the first study that incorporates the explanatory variables 'privatisation' and 'deregulation' in the regression models to examine the sources of shareholder wealth creation following M&A. Moreover from the review of literature it also appears that this is the first study that examines the determinants of shareholders' value creation following M&A in utility sectors. In the beginning of this Chapter I have discussed the importance attached to utility sectors. Therefore analysis of shareholder value creation following M&A of such regulated industries is an important contribution of this thesis.

Detailed discussion on the main findings of this thesis will be undertaken in Chapters 5 and 6 but briefly the key results of this thesis are as follows.

The findings of this study on shareholder value creation following M&A reinforce the existing evidence on wealth losses from M&A. However the interesting observation documented in these results is that the level of losses is quite low in comparison to that documented by the M&A literature in non-regulated industries. Detailed discussion of these results is given in Chapter 5.

The findings on the determinants of shareholder returns suggests that in the long run post merger period the shareholder returns are higher for those utility firms which were under state ownership and were subject to privatisation. This is in comparison to the utility firms that were in private sector since their inception. Another observation obtained from the long run multiple regression analysis is that the shareholder returns are higher for domestic mergers in the 1 year post merger period but in the 3 years post merger period the shareholders of cross border mergers have earned higher returns. The detailed interpretation of these results is given in Section 5.4 of Chapter 5. This is a significant finding for all organisations contemplating cross-border M&A in the utility sector.

Moreover it is also evident from the results in Chapter 6 that synergy is the predominant motive behind M&A of European utility sectors. But some presence of agency motive is apparent from the combined gains figure. These findings have not been documented in the literature before.



## 1.6 Outline of the thesis

The rest of the thesis is structured as follows. Chapter 2 reviews the literature relating to the privatisation, liberalisation and deregulation of utility sectors in Europe. This review discusses why utility sectors were transformed from state owned enterprises to privately owned companies and the role of regulation. Moreover this review also documents the performance of utility sectors in Europe in the post privatisation and deregulation setting. This is followed by a review of evidence on M&A in European utility sectors. This review discusses some of the motives of the electricity sectors to engage in M&A.

Subsequently this Chapter presents the different M&A literature in finance in non-regulated industries. This review captures the empirical evidences on shareholder wealth creation both in the short run following the announcement of M&A and in the long run following the completion of M&A. Moreover I have also reviewed the evidence on the motives behind the M&A in non-regulated industries based on the studies conducted in the US, the UK and continental Europe. Finally this Chapter reviews the US studies on M&A in utility sectors. This review documents the change in shareholder wealth both in the short run announcement period and in the long run post merger period following M&A in the US utility sectors.

Chapter 3 identifies the literature gap based on the review conducted in Chapter 2. Specifically this Chapter has identified that there is a lack of evidence on the performance and motives behind M&A of European utility sectors from finance a theory perspective. Following this gap in the literature this Chapter presents three

research questions and develops a number of hypotheses based on these research questions.

Chapter 4 presents the methodology and data adopted in this thesis. This Chapter starts by justifying the selection of the methodology. This is followed by a detailed discussion of the methods that I have used in addressing the three research questions. The sample selection criterion to obtain the sample of European utility firms engaged in the M&A is also discussed. I present in this Chapter the summary statistics on the distribution of the target and acquirer firms engaged in M&A across the different utility sectors in Europe.

Chapter 5 provides an answer to the first two research questions. Firstly this Chapter discusses the result obtained on the short run announcement period change in shareholder returns of the target and acquirer utility firms using three benchmark models. Secondly this Chapter presents the evidence obtained on the long run post merger change in returns of the shareholders of the merged utility firms. Thirdly this Chapter discusses the evidence on the determinants of the shareholder returns in the short run and in the long run.

Chapter 6 provides an answer to the third research question. In this Chapter I report the evidence obtained on the motives behind M&A of European utility sectors. Two different methods have been used to evaluate the motives behind M&A. This Chapter also provides the interpretation and implications of the results obtained regarding the motives behind M&A.

Chapter 7 is a summary of the thesis. It also narrates the key findings of this research. Finally this Chapter discusses the limitations of this study and makes some suggestions for further research.

## **Chapter 2**

### **Literature Review**

#### **2.0 Introduction**

The role of this literature review Chapter is to situate the research in the extant literature and thereby highlight the gaps in knowledge. This Chapter will help justify my interest in the area from an academic standpoint. As mentioned in Chapter 1, there are other reasons for interest, not least the potential policy implications of this research. This Chapter therefore presents the main literature relevant to my thesis. Critical observations regarding these studies, identification of gaps in literature, and the evolution of my research questions that I intend to examine in this thesis are discussed in Chapter 3.

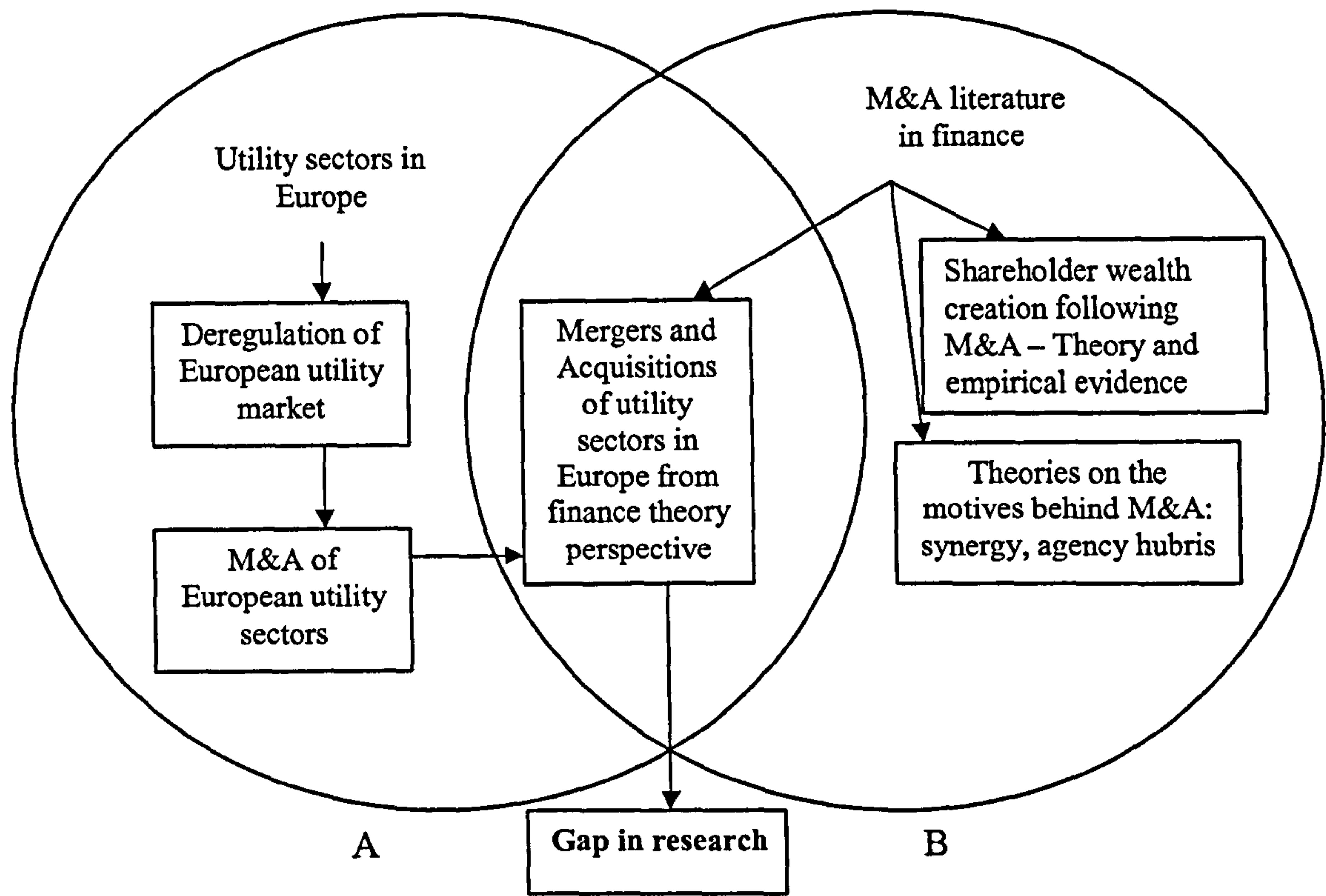
In Chapter 1 I have outlined that the aim of this thesis is to examine the causes and consequences of M&A of European utility sectors from finance theory perspective. Given this aim the purpose of this Chapter is to review two strands of literatures (1) pertaining to privatisation, liberalisation, deregulation and subsequently M&A of utility sectors in Europe and (2) related to the theory and empirical evidences of M&A from finance theory perspective. This is further illustrated in Figure 2.1 below.

Particularly Venn diagram A in Figure 2.1 illustrates the order of events that has shaped the present utility markets in Europe. Venn diagram B depicts the key areas of



investigation of M&A from finance theory perspective. This thesis is situated in the area of overlap between A and B.

**Figure 2.1 Illustration of the review of literatures**



The purpose of reviewing these two different strands of literatures is given as follows. First Section 2.1 provides a brief<sup>13</sup> review of the existing literature on the privatisation, liberalisation and deregulation in different utility sectors across Europe. The reason behind reviewing these studies is to provide a background of how utility sectors evolved from state owned enterprises (SOEs) to privatised entities in the late eighties and how they performed following privatisation. The goal of this Section is to shed light on the importance attached to utility sectors as providers of essential services, and in doing so I aim to establish the rationale for conducting research on utility sectors.

<sup>13</sup> Since the objective of this study is to examine the M&A of utilities therefore only a brief review has been conducted on the privatisation and liberalisation of utilities, in order to provide context.

Second in Section 2.2 I review the existing studies that examined the motives of European utility companies to engage in M&A. On the basis of this review I establish the need for conducting further research in this area.

Third in Section 2.3 I introduce the existing theory and empirical evidence in the finance literature on shareholder wealth creation following M&A in non-regulated industries. The objective of reviewing these studies is to introduce the key debates and methodologies surrounding shareholder wealth creation following M&A from finance theory perspective. As indicated in Section 1.3 of Chapter 1 in this thesis I aim to examine shareholder wealth creation following M&A of European utilities. So this review will enable the comparison of the empirical evidences obtained in this thesis on M&A in regulated European utility sectors with the existing M&A literature in non-regulated industries. In this Section I also discuss some empirical evidences on M&A in the regulated electricity utility based on the US studies. In addition the discussion of the methodologies on shareholder wealth creation in this Section will help to determine and explain the choice of methods that I apply in this research.

Fourth in Section 2.4 I review the extant studies on the theory and empirical evidences underlying the motives behind M&A in non-regulated industries. As I have indicated in Section 1.4 of Chapter 1 one of the objectives of this thesis is to examine the motives behind M&A by European acquirers of utilities. Hence through the review of these studies I present the key evidence on the motives behind M&A as reported by existing literature. Moreover in this Section I also discuss the methodologies applied within this existing literature to analyse the motives behind M&A. This will help to

justify the choice of methods that I apply in this research. Finally in Section 2.5 I provide a summary of this chapter.

## **2.1 Privatisation, liberalisation and deregulation of utility sectors in Europe**

In this Section I firstly discuss the transformation of utility sectors in Europe from being state owned enterprises to privatised entities. Secondly in this Section I review the different empirical evidence on the performance of these sectors in the post privatisation and deregulation period.

Several explanations for the choice of privatisation of utility sectors are documented in theory and empirical literature. The main reasons were: an overriding political need driven by a strong belief in the power of market forces (Jones, 2001); to reduce the financial burden of the state (Yarrow, 1986; Nestor and Mahboobi, 2000); to improve efficiency by encouraging competition and allowing firms to borrow from the capital market (Yarrow, 1986); to encourage a wider share ownership (Gripaios and Munday, 1998); to introduce market discipline (Yarrow, 1986). Yarrow argued that when the performance of a particular utility company is poor its share prices would fall and threats of takeover by a more efficient management would increase. Hence the threat of takeovers serves as a disciplining factor on incumbent managements. Furthermore Gripaios and Munday (1998) suggested that market discipline should ensure a more efficient allocation of resources.

In Chapter 1 I identified that privatisation of utilities was also accompanied by the introduction of competition and the liberalisation of European utility markets. Competition was also introduced to promote internal as well as allocative efficiency



(Vickers and Yarrow, 1988). Competition was further encouraged in the network utilities because it was believed that competition would lead to greater productivity thereby widening consumer choice and lowering prices (Heritier, 2001). Moreover technological changes also created opportunity for competition in these utility sectors which were previously considered natural monopolies (Parker, 1997; Nestor, 2005).

As outlined in Section 1.1 of Chapter 1 Vickers and Yarrow (1988) argued that the theory of strategic entry deterrence and predatory behaviour might thwart competitors by their anticompetitive tactics. Armstrong et al (1994) suggested that regulation should be introduced to prevent the problem of market failure. The most likely form of market failure that may emanate in utility industries is through the abuse of market power<sup>14</sup>. So it was accepted by policy makers that liberalisation should be accompanied by regulation to ensure that potential competition is effective (Vickers and Yarrow, 1988). Both in the UK and continental Europe the policy makers ensured that the role of regulation was to strike a balance between the interests of both the producers and the consumers (Parker, 1997; Dnes et al, 1998; Heritier, 2001; Parker 2003). Other intended objectives of deregulation are to ensure that there is no regulatory capture<sup>15</sup> by the regulatee and there is no regulatory risk<sup>16</sup>.

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<sup>14</sup> When there is only a single firm operating in the market it might lead to monopoly abuse. Since the demand for utilities is inelastic, consumers will be bound to pay whatever prices are charged by the producers. Hence in theory a profit maximising monopolist will set price above marginal cost leading to allocative inefficiency. Moreover the monopolist may not have sufficient incentives to cut their costs or introduce new products. This might result in productive inefficiency (Armstrong et al, 1994).

<sup>15</sup> Regulatory capture refers to the unwelcome situation where the regulator acts in the interests of the incumbents in the industry rather than those of consumers or potential entrants to the industry (Vickers and Yarrow, 1988, Ch. 4)

<sup>16</sup> Regulatory risk refers to the risk faced by utility companies of being prone to regulatory intervention. This occurs if utility companies could not predict the actions of the regulators (Vickers and Yarrow, 1988, Ch. 4).



So far in this Section I have discussed the transformation of different European utility sectors from SOEs to privatised entities. One key observation that has evolved from this discussion is the importance that has been attached to utility sectors for being providers of essential services. Given that the demand for utilities is inelastic the significance of these sectors to the consumers cannot be overstated. In addition since these sectors contribute a major share to a country's GDP so they exert a major influence on a country's economy. In fact it is due to these reasons that even after passing utilities into private hands some kind of economic regulation were implemented on these sectors. Next I review the empirical studies that have examined the actual outcomes of privatisation and deregulation of utilities.

In examining the actual outcomes of privatisation, the general consensus from most previous studies was that privatisation indeed led to a reduction in costs and prices (Newbery, 1997; Parker, 1997; Parker, 2003; Florio, 2007). UK studies on the role of price cap regulation document that the shareholders of utility companies earned higher returns after privatisation (Parker, 1997; Dnes et al, 1998). Parker (1997) also documented that price cap regulation was effective in the UK in equitably distributing the efficiency gains between shareholders in terms of higher profits and consumers in terms of lower prices. Dnes et al (1998) reported that overall the regulatory impact on shareholder returns were positive, and documented that the RPI-X price cap regulation was generous to the electricity companies.

There is also a significant political debate on the efficacy of service delivery of different utility sectors under privatisation. For instance, in the UK the Labour Party criticised the Conservative Government's decision to privatise utility sectors. This

was also triggered by the media who construed that the high returns made by utility sectors are a result of deceiving the regulators during price setting (Jones, 2001). Once in power in 1997 the Labour government's immediate action was to fulfil its election pledge and impose windfall tax on the profits of utility companies. The review of studies in the next Section will reveal how this action of the Labour Government was responsible for the retreat of the US electricity companies from the UK market.

### ***2.1.1 Summary***

The review of empirical evidences on the performances of utility sectors following privatisation and deregulation has highlighted the plurality of research that has been conducted on utilities in the UK and continental Europe. This admittedly brief review in turn shows the importance that is attached to these sectors. This is apparent from the extent of the interest that privatisation, liberalisation and deregulation of utilities have attracted from its various stakeholders like producers, consumers and even from political parties. The extent of the interest reflects the political importance of these sectors, and helps justify detailed research of the type reported here. One key reason that triggered such a vast amount of research on utilities is the change of ownership and introduction of deregulation or re-regulation in these sectors. But these are not the only changes that have happened in these utility sectors. As mentioned in Chapter 1 the privatisation, liberalisation and deregulation of utilities introduced the market for corporate control in utility sectors. Utility sectors in Europe subsequently witnessed a significant number of mergers and acquisitions. This calls for a need of research on the performance of different utility sectors in Europe following M&A. In the next Section I review the existing studies on M&A of utilities in Europe and in doing so I

shall introduce a gap in our understanding of the importance of M&A in these critical industries.

## **2.2 Mergers and Acquisitions of utilities in Europe**

Nestor (2005) documents that subsequent to privatisation and liberalisation of utilities market the governments in most European countries tried to retain limited residual control over these companies through the principle of golden shares. The golden shares allowed the government to confer a veto right in case of a transfer of control by shareholders (Dnes et al, 1998; Loredo and Suarez, 2000; Nestor, 2005). However extant literature revealed that the small size of many European home markets prevented effective competition in the product market subsequent to privatisation and deregulation (Loredo and Suarez, 2000; Nestor 2005). Moreover Loredo and Suarez (2000) also argued that cross border mergers in utilities would also bring in potential synergies that could benefit both consumers and shareholders (Loredo and Suarez, 2000). Therefore the need to open the economy to foreign investment was acknowledged in order to avoid private monopolies or oligopolies (Loredo and Suarez, 2000). Subsequently golden shares were removed in the UK in 1995 (Dnes et al 1998) and European Union outlawed golden shares in 2002 (Nestor, 2005). This opened the door for mergers and acquisitions within utility sectors in Europe.

In this Section I review the existing empirical evidence on M&A of utilities, and especially European utilities. I thereby highlight the gaps in these extant studies leading to the formulation of a research question later in Chapter 3.



### ***2.2.1 Review of extant studies on the motives behind mergers and acquisitions of utilities***

The consolidation of European utilities subsequent to deregulation and liberalisation has the general tendency to transform utilities industries from a monopoly to an oligopoly. This theme has been identified within the literature, and here is a small illustrative example. In the context of mergers and acquisitions of utilities in the U.S, Becker Blease et al (2008, p.24) state “....in a deregulated market utilities needed to be large to capture efficiencies in procurement, production, marketing, and administration and thereby remain competitive”. Mitchell and Mulherin (1996) in the US context termed the deregulation of utilities as industry shocks. This study argues that takeovers or mergers are often the most cost efficient means of restructuring following such ‘industry shocks’. Eckbo (1983) argued that takeovers among electric utilities are usually justified by management as a means of effecting increased efficiency, through operative synergetic effects resulting from economies of scale and scope. These studies reflected some general consensus on the need for M&A in utility sectors. Next I review some of the previous studies on M&A in European utilities. I have drawn the critical insights and gaps emerging from a review of these studies at the end of this Section.

Ghobadian et al (1999) examined the motivations of the US acquirers of electricity companies to enter into the UK electricity market. They documented that the principal motivations for the US companies to enter into the UK electricity market were growth strategy and revenue generation, market entry, organizational and financial synergy and the benefit of diversification (Ghobadian et al, 1999). This study also found a



variety of disincentives that deterred some of the US companies to enter into the UK electricity market. Ghobadian and Viney (2000) further analysed the reasons for the retreat of some of the US companies from the UK electricity market. Drawing data from archival sources they concluded that the main reason for the retreat of these US companies was the failure of the UK market to live up to the expectations of these investing companies. This failure is attributed to external factors, market failures and actions of competitors. External factors here refer to the then Labour Government's decision to levy a 'windfall tax' upon the monopoly profits of the companies of the electricity supply industry (ESI) which the US companies' argued prevented a level playing field for business in the UK. The authors refer to market failure as the fall in consumption of electricity, which in turn prevented the creation of real market opportunities to the US companies. The action of the competitors here is the failure of these US companies to form synergistic unions with other US companies in the UK market. The authors also argued that some of the US companies were unable to defend a global presence while some of the UK acquired companies were resistant to the precise strategies that the US companies were seeking to develop.

The subsequent literature on M&A of utilities in continental Europe has shown that a considerable number of utility companies are consolidating in Europe's utility market in order to strengthen its geographic position, gain a fast entry into a new market, and to gain access to end customers (Allas, 2001). This study suggested that most of these M&A deals were overpriced. The reasons cited for these arguably excessive premiums were mostly associated with strategic considerations, such as strengthening of geographic position, fast entry into a new market and access to end customers. Freytag et al (2005) found that the primary motive behind M&A of utilities is to

increase the market power. This study looked into the M&A of energy utilities by observing 70 takeovers of the US and 69 takeovers of German firms between 1990 and 2002. They reported that the market value of the acquiring firms on the day of the merger announcement rose suggesting that markets perceived the mergers as a potential to increase market power. This study also reported that the market value on the announcement date increased even for the competitors. The authors suggested this as an indication that they, i.e. the competitors, themselves are likely to become takeover targets.

### *2.2.2 Summary of studies on mergers and acquisitions of utilities in Europe*

The studies reviewed in this Section have been summarised in Table 2.1. From the review of the studies in this Section on M&A of European utilities I document that these studies have examined the motives behind these mergers and acquisitions. But all of these studies have examined the M&A only in the electricity sector. Since in Europe all utility sectors have been subjected to M&A following deregulation there is a need to examine M&A for all the different utility sectors. Moreover most of these studies have examined the M&A of European utilities from a strategic perspective<sup>17</sup>. From this review of studies it is therefore apparent that there is no evidence on the performances of these European utility sectors following M&A from the finance literature perspective.

From the above discussion the crucial gap in literature that has evolved is to examine the M&A of European utilities from a finance theory perspective. Empirical literature

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<sup>17</sup> There are different alternative perspectives on mergers (Sudarsanam, 2003, ch 3). These are economic perspective, strategic perspective and finance theory perspective. This thesis will examine the M&A of utilities from finance theory perspective.

in finance evaluates the performance of M&A by examining the change in shareholders wealth creation following M&A. A small number of studies in finance literature on M&A have also examined the motives behind M&A based on the three predominant theories behind M&A. These theories are synergy, agency and hubris. In the next two Sections I will review the empirical studies that have examined the M&A from a finance theory perspective.

**Table 2.1                      Extant studies on the motives behind M&A in utilities**

Research Paper	Country	Results
Ghobadian et al (1999)	U.K.	Principal motivations were growth strategy and revenue generation, market entry, organizational and financial synergy, risk diversification
Ghobadian and Viney (2000)	U.K.	Reasons for retreat were external factors, market failures and actions of competitors
Allas (2001)	Europe	Strengthening of geographic position, gain a fast entry in a new market and to gain access to end customers
Freytag et al (2005)	U.S. and Germany	German energy market has a higher potential to increase market power compare to the US market through M&A

**2.3 Stock market performance following mergers and acquisitions: Theory and empirical evidence**

In the previous Section I have reviewed the extant studies on the motives behind M&A of utilities. From the review of studies in the previous Section it is clear that there is a lack of evidence on the performance of the European utility sectors following M&A from a finance theory perspective. Finance literature evaluates the success of M&A by examining the shareholder wealth creation following M&A



(Sudarsanam, 2003; Martynova and Renneboog, 2008). For this reason one of the most extensively researched areas in finance has been whether M&A create value for the shareholders of both the acquirer and the target firms. In finance theory shareholder wealth impact is examined by looking at the short run and the long run stock price performance of the companies that were engaged in M&A (Andrade, 2001; Sudarsanam, 2003). There is an extensive volume of academic literature that examines the performance of the target and acquirer shareholders returns following M&A. In this Section I have reviewed these empirical studies.

I have divided this Section further into the following Subsections. Specifically in Subsection 2.3.1 I discuss the theory underlying the short run event study methodology which evaluates the change in shareholder returns following the announcement of M&A. In subsection 2.3.2 I discuss the empirical evidence on the short run abnormal returns<sup>18</sup> accrued to the shareholders of the target and acquirer firms following announcement of M&A in non-regulated industries. In Subsection 2.3.3 I review the theory and empirical literature surrounding shareholders wealth creation in the long run post merger period. In Subsection 2.3.4 I discuss the determinants or drivers of shareholders' returns as reported by empirical studies that I have reviewed in Table 2.2 and Table 2.3. Finally in Subsection 2.3.5 I review the empirical literature on shareholder wealth creation following M&A in utilities.

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<sup>18</sup> The abnormal returns are the returns accrued to the shareholders above the normal returns. The normal returns are the returns that the shareholders are expected earn in the absence of any corporate event (Sudarsanam, 2003, p. 90).



### 2.3.1 The efficient market hypothesis

The effect of mergers and acquisitions in the short run on shareholders' wealth has been analysed using short run event study methodology<sup>19</sup> (Datta et al, 1992; Schwert, 1996; Andrade et al, 2001). Event study methodology is based on the efficient market hypothesis. Theoretically efficient market hypothesis (EMH) states that the market price of common stock reflect all publicly available information (Fama 1970). EMH posits that if securities markets are efficient then security prices should fully incorporate the expectations and information of all market participants and would also respond quickly and without bias to new information (Cornell and Morgan, 1990). Thus the proponents of EMH posit that in an efficient market the stock price of any company at any time reflects the market's best estimate, based on publicly available information, of the present discounted value of cash flows from the company. If new information becomes available to the market, the stock price of that company will adjust to reflect the market's new estimate of that discounted present value.

The seminal work of Fama (1970) subdivided the empirical work on efficient market into three parts: weak form, semi strong form and strong form. The weak form efficient market implies that current security prices reflect all information of past price histories. The semi strong form efficient market postulates that current security prices reflect all publicly available information. Lastly the strong form efficient market test implies that security prices reflect all available information both public and private. This study reviewed the empirical work of earlier studies and concluded that there is hardly any evidence which contradicts the EMH.

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<sup>19</sup> Details of event study methodology will be discussed in Chapter 4.

Fama (1991) further reviewed the literature on market efficiency and in this study he updated the three forms of market efficiency that he documented in his earlier work (1970). In this paper he divided the existing empirical works on market efficiency into the following categories: (a) tests for return predictability<sup>20</sup> (b) event studies<sup>21</sup> and (c) tests for private information<sup>22</sup>. Fama (1991) concluded that event study methodology provided the most conclusive evidence on market efficiency since security prices respond quickly to the announcement of corporate events, usually just within a few days. This study of Fama (1991) has drawn support for this theory on the basis of existing empirical work on event studies. Drawing references from earlier empirical works this study has showed how using event study stock price response following different corporate announcements could be captured. Under event study if daily data is used than it will eliminate the joint-hypothesis problem which states that market efficiency must be tested jointly with an asset pricing model. This is because with daily data average stock prices adjust within a few days to the event announcements. Rubinstein (2001) further states that EMH works under the assumption that investors are rational.

### ***2.3.1.1 Summary***

Given the theoretical arguments based on the EMH, the event study methodology has achieved immense popularity in the field of M&A research in corporate finance (Andrade, 2001; Sudarsanam, 2003). A large number of empirical studies have applied this methodology to determine shareholder wealth creation following the

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<sup>20</sup> Tests for return predictability examine how well past returns can predict future returns.

<sup>21</sup> Event studies examine how quickly security prices reflect public information announcements.

<sup>22</sup> Tests for private information examine whether investors have any private information that is not fully reflected in market prices (Fama, 1991, p. 1576).

announcement of M&A (Bruner, 2002). Therefore following these empirical studies in this thesis I intend to apply this methodology to examine the change in security returns of the target and acquirer shareholders following the announcements of M&A in utility sectors by European acquirers. Further justification on the choice of event study methodology will be discussed in Section 4.2 of Chapter 4. The next subsection reviews the empirical evidence on the short run stock market performance following M&A announcements based on the efficient market hypothesis.

### **2.3.2 Short run empirical evidence on the changes in shareholder wealth following M&A**

This Section documents the empirical evidence on the returns to shareholders of target and acquiring firms in the short run. Short run returns here refers to the returns earned by the shareholders of the target and acquirer firms in the short event window (generally a maximum period of one month) surrounding the announcement date of the M&A. The reviews of extant studies in the next two sub-sections are broadly divided into the US, the UK and continental Europe. Following Bruner (2002), Sudarsanam (2003) and Campa and Hernando (2004), in this study I conduct a meta-analysis of the empirical evidence on the announcement period returns for the target and acquirer firms in Table 2.2. The meta-analytic approach provides an integration of several studies that addresses a set of related research hypothesis. In this meta-analysis the research hypothesis relates to whether the target and acquirer shareholders earn positive abnormal returns following the M&A announcements. Panel A of Table 2.2 provides the summary of evidence obtained from studies based on the UK and continental Europe; Panel B provides evidence based on the US



studies. Further discussion on the empirical evidences obtained from this table is given in Section 2.3.5.

### ***2.3.2.1 Discussion on the benchmark models used by the short run studies***

The extant studies that I have reviewed in Table 2.2 have used short run event study methodology to examine stock price performances. The abnormal returns (see Footnote 12 of Chapter 1, p.17) are examined in the event study methodology using different benchmark<sup>23</sup> models. From the review of empirical studies in Table 2.2 it is seen that most of the studies have used OLS market model as a benchmark to analyse the target and acquirer abnormal returns in the short run following the announcement of M&A. The reason for the popularity of the OLS market model is that it is well specified under a variety of conditions<sup>24</sup> (Brown and Warner, 1985). Some studies have used a capital asset pricing model (CAPM), a mean adjusted model and a market adjusted model as benchmarks. In Chapter 4 I describe the benchmark models that I have used in this thesis to determine the short run target and acquirer abnormal returns. I have also provided the justification for the choice of these benchmarks in Chapter 4.

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<sup>23</sup> Benchmark models: The actual returns of the target and acquirer firms surrounding the merger announcements are analysed with respect to some expected returns. These expected (normal) returns are calculated using different return generating models. These models are known as benchmark models. The abnormal returns are the difference between these actual and expected returns (Brown and Warner, 1980).

<sup>24</sup> Brown and Warner (1985) used a simulation approach to examine the impact of events on security returns. Using randomly selected securities and assigning a random event date to each security they analysed how the returns reacted around the event period. Their study showed that OLS market model are well specified under a variety of conditions.



### ***2.3.2.2 Short run empirical evidence of target firms***

From the review of the studies in Table 2.2 it is evident that based upon the UK and continental European studies and also in the US studies target shareholders invariably gained from the announcement of M&A. The average cumulative abnormal returns<sup>25</sup> (CARs) of the targets are in the 20-30% range in most of the extant studies that are reviewed. This result is consistent with previous reviews of extant studies reported by Jensen and Ruback (1983), Datta et al (1992) and Bruner (2002). Antoniou et al (2007) document that these gains to the target shareholders are not surprising given the large premiums they receive in M&A. Such studies also reveal that the target returns are higher in multiple bids (Franks and Harris, 1989; Bradley et al, 1988) and when cash is used as the method of payment (Andrade et al, 2001; Danbolt, 2004; Goergen and Renneboog, 2004). They have attributed this to the bargaining power of the target firms under multiple bids.

Overall the empirical studies of the UK, continental Europe and the US are unanimous in their conclusion that target shareholders gained in the short run following the announcement of M&A. Hence as Bruner (2002) concludes it is appropriate to say that an M&A transaction delivers a premium return to target firm shareholders.

Despite the weight of evidence on target shareholders' returns following M&A there is a need to extend these findings to M&A in utility sectors. I shall discuss this in further detail in 2.3.2.4.

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<sup>25</sup>CARs are obtained by cumulating the abnormal returns over different event windows (Sudarsanam, 2003, p.90).

### ***2.3.2.3 Short run empirical evidence of acquirer firms***

The evidence on the returns to acquirer shareholders is not very conclusive. The results from the extant studies reveal that the acquirer shareholders either earn negative returns or small positive returns around the announcement of the M&A. As Table 2.2 shows many of the studies have reported negative returns for the acquirer shareholders.

Evidence presented in Table 2.2 also shows that acquirer shareholders earn more when there is a single bid for the targets compared to multiple bids (Franks and Harris, 1989; Bradley et al, 1988, Cakici et al, 1996). Antoniou et al (2007) also found that acquirer CARs are higher when they buy private and subsidiary targets compared to public targets. From the review of empirical studies on acquirer returns it is evident that the acquirer returns are much lower than the targets. However there is a lack of evidence on acquirer shareholders' returns following M&A of utilities. I have discussed this point further in 2.3.2.4 below.

### ***2.3.2.4 Implications from the short run empirical evidence***

This Section has reviewed the literature on shareholder wealth changes following the announcement of M&A. The studies on the short run stock price performance are based on the market efficiency paradigm. The general consensus from the review of literature on the short run announcement period change in shareholder returns suggests that target shareholders have earned significant positive returns following the announcement of M&A. The acquirer shareholders on the other hand earned negative

or very small positive returns. None of these studies however have examined the target and acquirer returns following M&A in the regulated sectors like European utilities.

Historically for many years utility sectors in Europe were under state ownership. As discussed in Chapter 1 one of the consequences of privatisation, liberalisation and deregulation of European utilities in the 1990s was that it created the market for corporate control. Thus from the mid 1990 onwards (particularly after the removal of the principle of golden shares) utility sectors in Europe has witnessed a growing trend in M&A. This is the first time when utility sectors in Europe witnessed such a significant rise in M&A like their counterparts in non-regulated industries. Hence one possible reason for this lack of studies is due to lack of availability of data on M&A in utility sectors prior to the early 1990s.

Moreover since utility sectors are regulated and they bear important influence on a country's economy so whether announcement of M&A in these sectors generates positive returns for the shareholders deserves important consideration. Thus one of the objectives of this thesis is to examine the change in stock price performance of the target and acquirer shareholders following the announcement of M&A in the context of M&A of European utility sectors.

Table 2.2					
Summary of studies on the short run announcement period returns to the shareholders from M&A					
Study; sample period; event window	Acquirer cumulative abnormal returns around announcement (CAR)	Target cumulative abnormal returns around announcement	Benchmark models used in event study	Country/Domestic or cross border	Results
Panel A: Evidence from UK and continental European Studies					
Franks and Harris (1989); 1955-1985	1%	23%	Market model, market adjusted and CAPM	U.K. Domestic	Acquirers earn more in single bids and tender offers while targets earn more in multiple bids and tender offers compared to single bid and other kinds of M&A
Sudarsanam et al (1996); 1980-1990	-1%	14%	Market model	U.K Domestic	The study also found that large shareholding decreased returns for the acquirers. The study also confirmed that large shareholdings and presence of acquirer toehold decreased returns for the targets
Higson and Elliott (1998); 1975-1990;	0.43%	37.5% for overall sample; 42.7% for hostile takeovers and 36.6% for friendly takeovers	Size	UK	The authors attributed higher returns for hostile takeovers to anticipated performance gains.



Corhay and Rad (2000); 1990-1996	0.62% for European acquisitions, - .38% for East European acquisitions 0.16% for US acquisitions	Market Model	Dutch acquirers and cross-border targets	<p>The authors attributed the higher CARs for US acquirers to the more competitive US market compared to European counterpart. This study further reported that the degree of internalisation of the target firms is negatively related to acquirer CARs. Moreover in this study unlike most other empirical studies diversifying M&amp;As generated higher returns to acquirers compared to related M&amp;As.</p>
Cybo-Ottone and Murgia (2000); 1988-1997	0.99%	Market model	13 European banking industry	<p>This study also found that domestic mergers and smaller deals generated more value to shareholders compared to cross-border mergers.</p>
Doukas et al (2002); 1980-1995	1.19% for focused acquisitions and -.52% for diversifying acquisitions	Market model	Sweden	<p>This study reported from its results that in diversifying acquisitions agency costs and operating inefficiencies outweighs diversification benefits.</p>
Lowinski et al (2004); 1990-2001	CAR of 1% in the (-1,+1) window and zero in longer event windows	Market model	Swiss acquirers and cross border targets	<p>The CARs are higher for domestic acquisitions compared to cross border acquisitions. The difference between domestic and cross border acquisitions is not significant. The authors attribute this finding to the integration of the EU markets.</p>

Campa and Hernando (2004); 1998-2000	0.44% CARs are higher in unregulated industries and in domestic mergers	4%. CARs are higher in cross-border deals and in unregulated industries	CAPM	EU Countries.	<p>This study concluded that shareholder value creation is less in cross-border deals and in regulated industries (financial industries). The authors suggested that shareholders are heavily penalised for embarking on M&amp;A in foreign companies. This is due to the presence of cultural, legal and transaction barriers that prevails across different European countries.</p>
Goergen and Renneboog (2004); 1993-2000	0.7% The CARs are higher in domestic, friendly and equity offered M&As	9.01% The CARs are higher in cross-border, hostile and cash offered M&As	CAPM	18 European countries.	<p>The study concluded that higher bid premiums for acquirers in cash offers led to lower CARs. The authors also suggested that higher bid premium that the acquirer needs to pay in a hostile M&amp;A led to lower CARs.</p>
Danbolt (2004);1986-1991		20.23% for domestic and 21.97% for cross border	Index model, size decile and CAPM	UK Domestic and Cross-border acquisitions	<p>The study interpreted that since target firm receives cash in cross-border mergers compared to stock in domestic mergers therefore it led to the higher CARs in cross-border mergers. This is because cash transaction signals to the targets that the acquirer stock is overvalued and hence the target investors reacts favourably to cash transactions</p>
Gregory and McCorriston (2005); 1985-1994	-0.002		Market model	UK acquirers of cross-border targets	<p>This study reported negative and insignificant CARs for US acquisitions compared to EU and rest of world acquisitions. The study further concluded that macro economic factors are the main determinants of short run results.</p>

Conn et al (2005); 1984-1998	0.59%	Market adjusted	UK public companies acquiring domestic public, private and cross- border private and public companies	<p>The study found that acquirer returns are positive and significant for acquisition of private targets while it is negative for public targets for both domestic and cross-border acquisitions.</p> <p>This study reported that acquirer returns are higher for acquisitions of private targets and subsidiary targets compared to acquisitions of public targets. This result is consistent after controlling for relative size, acquirer's book to market ratio, target origin and industry diversification. The authors attributed this result to the fact that private firms offer their shares at a discount to attract potential acquirers.</p>
Antoniou et al (2007); 1987-2004	1.26%	Market adjusted	UK frequent acquirers buying public, private and subsidiary targets	
Panel B: Evidence from US studies				
Bradley et al (1988); 1963-1984	0.97%	Market model	US tender offers	<p>The study found that acquirer returns are lower in multiple bids compared to single bids. However the target firms' returns are higher in multiple bids compared to single bids.</p> <p>The authors found that acquirers CARs differ across countries. Japanese and Canadian acquirers earn positive CARs while UK acquirers earn negative CARs.</p>
Eun et al (1996); 1979-1990	-1.20%	Mean adjusted	US targets and cross-border acquirers	



Cakici et al (1996); 1983-1992	.63% for foreign acquirers of US firms and -.36% for US acquirers for foreign firms	Market Model	US targets and cross-border acquirers	<p>This study found that differences in CARs between different foreign acquirers are attributable to the different accounting practices followed by different countries which in turn impact market decisions. This research further showed that relative size, overseas exposure, or target's R&amp;D exposure do not relate to acquirers' CAR. However the result showed that multiple acquirers for same targets reduced the acquirer CARs. Non-conglomerate mergers are favourable for acquirers. Conglomerate mergers create more wealth for target firms. Net synergistic gains is however significant in non-conglomerate mergers compared to conglomerate mergers. This study attributed pure financial factors to influence the merger induced security values</p> <p>This study found that acquisition activity is higher in industries undergoing deregulation. The authors attributed this to the fact that deregulation removed the regulatory burden thereby increasing restructuring of these industries. This research indicated that acquisitions and divestitures in the 1990s are a response to this restructuring activity.</p>
Maquieira et al (1998); 1963-1996	6.14% for non- conglomerate and -4.79% for conglomerate mergers	Valuation prediction error	US stock for stock mergers	
Mulherin and Boone (2000); 1990-1999	-0.37%		US acquisitions and divestitures	
	41.65% for conglomerate and 38.08% for non- conglomerate mergers			
	20.00%			



Schwert (2000); 1975-1996	-0.02%	20%	Market Model	All successful and unsuccessful US takeover bids	<p>The result from this study showed that target premium is higher for un-negotiated offers. The acquirers' returns are positively related to size and cash offers. The results further concluded a lack of strong relation between hostility and acquirers' stock returns. The authors suggested that this is because the choice made by the acquirer is strongly affected by the perceived attitude of the target firm.</p> <p>This study found that when stock is used as a method of payment acquirers CARs fall. The result also showed that target returns are higher when cash is used as a method of payment. The reason provided by this study is similar to panel A that stock payment is made when acquirers stock is undervalued and hence it is perceived negatively by the market.</p>
Andrade et al (2001), 1973-1998	-0.60%	16%	na	US	<p>This study reported that focused mergers earn more than diversifying mergers. This study concluded that this result implies that focused mergers removes the impediments that is present in diversifying acquisitions such as different geographic location and thereby increases value.</p>
Delong (2001); 1988-1995	-1.68%	16.61%	Market model	US mergers in which at least one party is a bank	

Houston et al (2001); 1985-1996	-3.47%	20.80%	Market adjusted	US bank mergers	<p>This study compared management projections of bank mergers with stock market reactions. The study found that the market responds positively with management projections of cost savings from mergers but it is significantly lower than the projections. The authors attributed this result to negative signal from stock-financed acquisitions and secondly to management's understating of costs and potential revenue loss from these mergers.</p>
Fuller (2002); 1990-2000	1.77%		Modified market model	US	<p>This study document that for the same acquirers who acquired public, private and subsidiary firms the returns are positive when they buy private and subsidiary and negative when they buy a public target. This gain is even higher for larger targets and when acquirer pays by stock. The authors attribute this result to a liquidity discount<sup>26</sup> and tax and controls effects in the market.</p>
Moeller (2004); 1980-2001	1.102%		Market model	US	<p>This study documents that small acquirers earn higher returns than large acquirers. This result is also robust across different time periods, different sub samples and different firm and deal characteristics. The authors attribute this result to managerial hubris of the large firms.</p>

<sup>26</sup> When acquirers acquire private firms or subsidiaries, they are purchasing assets in a relatively illiquid market. Thus higher returns to acquirer shareholders reflect a liquidity discount (Fuller et al, 2002).

### **2.3.3 Long run studies on shareholder wealth changes following M&A**

Subsection 2.3.2 above has reviewed the studies on M&A that examined the short run returns of the shareholders following the announcement of M&A. There are also a group of studies that have examined the long run post merger returns of the shareholders of the merged entity. These studies have examined the post-merger returns as part of a larger study focusing on announcement period returns. Like Section 2.3.2 in this Section I have conducted a meta-analysis to present the long run empirical evidence on shareholder wealth changes following M&A. This is shown in Table 2.3. In Panel A I have reviewed the studies on the UK M&A and in Panel B I have reviewed the empirical evidence on the US M&A.

#### ***2.3.3.1 Discussion on the long run methodologies applied by the extant studies***

Table 2.3 shows that most of the long run studies have used Buy and Hold abnormal returns<sup>27</sup> (*BHAR*) methodology to compute the long run returns (Loughran and Vijh, 1997; Sudarsanam and Mahate, 2003; Megginson et al, 2004; Gregory and McCorriston, 2005; Conn et al, 2005; Dutta and Jog, 2009). This Table also shows that some of the extant studies have used Calendar Time abnormal returns methodology (*CTAR*).

Finance literature documents some methodological debates surrounding the computation of long run abnormal returns. For instance Barber and Lyon (1997) advocated buy and hold abnormal returns (*BHAR*) methodology to determine the long

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<sup>27</sup> Computational procedure of *BHAR* and *CTAR* has been discussed in Chapter 4.



run abnormal returns while Fama (1998) advocated calendar time abnormal returns (*CTAR*) method. Fama (1998) argued that since the *BHAR* method do not take into account the cross sectional dependence of the individual firms abnormal returns under calendar time overlap of event periods; hence it generates mis-specified test statistics. Lyon et al (1999) and Mitchell and Stafford (2000) attempted to resolve the methodological problems raised by Fama (1998) with the *BHAR* methodology. Mitchell and Stafford concluded that by using appropriate long run event study methodology the anomalies that were documented in most of the long run extant studies have been reduced. This study recommended the use of calendar time portfolio regression approach to determine the long run abnormal returns.

Due to these methodological debates some studies like Conn et al (2005) and Dutta and Jog (2009) have used more than one method to determine long run abnormal returns. A more detailed discussion on the justification of the choice of long run methodology that I have used in this thesis is given in Chapter 4.

#### ***2.3.3.2 Empirical evidences on the post acquisition change in shareholder returns***

Table 2.3 shows that almost all the extant studies (except Higson and Elliott, 1998) in both the UK and the US have documented the presence of long run post-acquisition abnormal returns to the acquirers. But most of the empirical studies have reported negative long run abnormal returns. Most of these studies have attributed the negative long run returns to some specific characteristics of M&A. I have discussed this in Section 2.3.5 below. Some studies have attributed these negative returns to methodological misspecifications (Agrawal, et al, 1992).



### ***2.3.3.3 Implications from the long run empirical evidence***

From the review of long run studies on post acquisition change in returns of the combined firm shareholders it is apparent that most of the studies have reported negative returns. However none of these studies are based on regulated sectors like utilities. This thesis aims to address this gap. There are several reasons to examine the long run post acquisition performance of the shareholder returns following M&A of European utilities. These are as follows. First, as mentioned earlier, the increase in M&A of European utilities took place in the later part of 1990s when the governments in most European countries outlawed the principle of golden shares. The long run M&A study generally requires stock price data three to five years following the completion of M&A which meant less scope for earlier studies to conduct long run empirical research following M&A of European utilities. Since considerable time has passed following the surge in M&A activity in European utility sectors so the data over a longer period is available to conduct the long run M&A analysis.

Second as outlined in Chapter 1 this research intends to examine the motives behind M&A of European utilities. I will discuss the theory and empirical evidence on the motives behind M&A in non-regulated industries in Section 2.4 below. Specifically this study aims to examine whether there is synergy, agency or hubris motives, or a combination of these motives, are present behind M&A of European utilities. This discussion of motives will remain incomplete until the firms' actual achievements of the intended outcomes of M&A are assessed. For instance if this research finds that synergy is the predominant motive behind M&A of European utilities then it is

Table 2.3					
Summary of extant studies on the long run post-acquisition shareholder returns					
Study; sample period	Type of acquisition	Methodology used in long run event study	Event window (months)	Acquirer abnormal return (%)	Notes
Panel A: Evidence from UK Studies					
Higson and Elliott (1998); 1975-1990	UK M&A	Holding period abnormal return using size as benchmark	36	1	This study concluded that there are no significant post acquisition gains to the shareholders. Post acquisition returns are not related to dividend yield or past return factors.
Sudarsanam and Mahate (2003); 1983-1995	UK M&A	Buy and hold abnormal return (BHARs) with size, market adjusted, book to market, mean adjusted portfolios as benchmarks	34	-8.71 to -14.8'	The authors concluded that value acquirers outperform glamour acquirers. The study also showed that cash payment acquisitions generated higher returns compared to stock offered acquisitions
Gregory and McCorriston (2005); 1985-1994	UK acquirers of cross-border targets	BHARs with size/ market to book portfolios	60	-0.0929	The study found significant negative returns for acquiring US targets compared to EU and rest of the world targets. Moreover the result concluded that acquisition in related industry earned negative returns. The study further concluded that R&D played a significant role in explaining the long run returns



UK public companies acquiring domestic public, private and cross-border private and public companies	Conn et al (2005); 1984-1998	BHARs and Calendar time abnormal returns (CTARs) with size/book to market portfolios	36	-9.02 for BHAR and -0.21 for CTAR'	This study showed negative long run returns for both domestic and cross-border acquisitions where the later earned lower returns than the former. The result also showed insignificant negative returns for private targets both in domestic and cross-border M&A. This study also found strong support of internalisation motive behind cross-border M&A.
UK frequent acquirers	Antoniou et al (2007); 1987-2004	CTARs with size/book to market control portfolios	36	-0.43	The acquirers of public, private and subsidiary targets all earned significant negative abnormal returns. The study concluded that the inconsistency between short run and long run result is attributed to market overreaction in the short run leading to eventual price reversals in the long run
Panel A: Evidence from US studies and other countries' studies					
US M&A	Agrawal et al (1992); 1955-1987	CARs using two return generating process models following (1) Dimson and Marsh (1986) and (2) Return across time and securities model (RATs) of Ibbotson (1975) with size as benchmark	60	-10.26	This study concluded that the negative post acquisition abnormal returns obtained in the result is inconsistent with the efficient market hypothesis. The authors attributed this result to a possibility of the slow adjustment of the market to the merger announcement. This study also found that conglomerate (diversified) mergers outperformed non-conglomerate (focussed) mergers in the long run.

Loughran and Vijh (1997); 1970-1989	US mergers and tender offers	BHARs with size/book to market as benchmark	60	43 for tender offers and -16 for mergers. - 24.2 for stock acquirers and 18.5 for cash acquirers. 4.25 and - 17.26 for glamour firms while 15.53 and 7.64 for value firm in mergers and tender offers respectively	<p>This study concluded that the acquirers' post acquisition returns are related to mode of acquisition (mergers or tender offers) and method of payment (cash versus stock). The study reported that hostile (tender offers tend to be hostile) cash acquisitions significantly outperformed friendly (mergers are more friendly M&amp;A) stock acquisitions. The author attributed this result to signalling theory<sup>28</sup>.</p> <p>The result of this study supported the performance extrapolation hypothesis<sup>29</sup> which implies glamour firms<sup>30</sup> underperformed in the long run both in mergers and tender offers compared to value firm. The authors attributed this result to the fact that glamour managers tend to be driven by hubris and overestimate an acquisition while value acquirers are more prudent in approving an acquisition. This study also tested the method of payment and EPS myopia hypotheses but the results did to support these hypotheses.</p>
Rau and Vermaelen (1998); 1980-1991	US mergers and tender offers	CARs with size/book to market as benchmark	36		

<sup>28</sup> Signalling theory implies that when acquirers offer to pay by stock it signals that their stock is overvalued and when they offer to pay by cash it signals that their stock is undervalued (Loughran and Vijh, 1997, also discussed in the announcement period results given in Table 2.2). Therefore stock acquisitions generate lower returns compared to cash acquisitions.

<sup>29</sup> Performance extrapolation hypothesis implies that the market extrapolates the past performance of the acquirers when it assesses the value of an acquisition (Rau and Vermaelen, 1998). This study suggested that glamour managers are more likely to overestimate their own abilities to manage an acquisition (driven by hubris) while value managers act more prudent in approving a major transaction.

<sup>30</sup> Glamour acquirers have a low book to market ratio and are highly valued as a result of their prior market performance while value firms have a high book to market ratio and have a low prior market performance (Rau and Vermaelen, 1998; Sudarsanam and Mahate, 2003).



Megginson et al (2004); 1977-1996	US mergers	BHARs with size/book to market as benchmark	36	-6.62	<p>This study reported that focus increasing (FI) mergers outperformed focus decreasing (FD) mergers. The authors also conducted a temporal analysis and found that the returns of FI mergers decreased over the years while for FD mergers it is vice versa. Finally the study concluded that the two main determinants of long run returns are corporate focus and method of payment.</p>
Dutta and Jog (2009); 1993-2002	Canadian M&A	BHAR and Calendar time portfolio approach using reference portfolio, size/book to market as benchmarks	0.001 in BHAR and .004 in Calendar time portfolio approach		<p>This study reported that there are no significant long run negative abnormal returns compared to other US studies. This study attributed this to the unique Canadian regulatory or capital market environment.</p>

expected that the change in shareholder value in the long run post acquisition period would be positive. The aim of this research is partially to address this question.

The third reason for examining the long run post acquisition returns of the shareholders of the combined utility firms relates to the nature of utility sectors itself. Since the regulators of utilities are guided by public interest considerations they might perceive any merger as anticompetitive. For this reason even in the post merger period the merged utility companies are under constant regulatory scrutiny (Loredo and Suarez, 2000). In this context I analyse whether the post merger shareholder returns of the combined entity are affected as a consequence of regulatory pressures.

#### **2.3.4 Empirical evidence on stock market reaction following M&A in utilities**

The review of the empirical studies on the short run and the long run stock price performance following M&A shows that none of these studies have examined shareholder wealth creation following M&A in utilities. In this Section I review the existing empirical studies that examined shareholder wealth following M&A in utility sectors. This is shown in Table 2.4

These empirical studies on M&A in utilities are based on the US data. The studies of Leggio and Lien (2000) and Becker-Blease et al (2008) outlined that the primary objective of their studies was to examine whether M&A in the electricity sector following deregulation leads to value enhancing M&A. Table 2.4 also documents that the empirical evidence of M&A in utilities is in line with empirical evidence of M&A in non-regulated industries where target shareholders gained from M&A while

acquirer shareholders suffered losses (Bertunek et al, 1993; Berry, 2000; Leggio and Lien, 2000; Becker-Blease et al, 2008).

However it is evident from Table 2.4 that although the target gains are positive the level of target gains is not as large as those earned in non-regulated industries. Leggio and Lien (2000) attributed this lower target return to the regulatory nature of utility sectors. The authors suggested that due to the economic regulation of utilities the acquirers of these utilities were reluctant to pay a higher target premium. This is because the acquirers were sceptical that the regulators might disallow the recovery of these target premiums by including them in the rate base<sup>31</sup>. Furthermore these studies revealed that the acquirer shareholders incurred lower returns than their counterparts in non-regulated industries. Leggio and Lien (2000) also suggested these lower acquirer returns are a result of the regulatory nature of utility sectors where the regulators frequently prevent mergers from taking place, and the small savings associated with these mergers. Bertunek (1993) and Ray and Thompson (1990) pointed out that the lack of prior experience of utilities in acquiring and integrating the merged companies is also another reason for the lower returns earned by these sectors. For the long run performance Becker-Blease et al (2008) documented that the post merger buy and hold returns of the electricity companies are either the same or worse than the control sample. However, all the studies that I have reviewed in Table 2.4 are based on M&A of the US utilities, and especially the US electricity companies. Hence these results cannot be generalised for other utility sectors.

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<sup>31</sup> This is specific to US utilities where utility sectors are subjected to rate of return regulation.



Table 2.4					
Summary of extant studies on mergers and acquisitions of utilities					
Study; sample period	Country	Short run Target returns (%)	Short run Acquirer returns (%)	Combined gains (%)	Long run returns
Bertunek et al (1993); 1980-1991	US utilities	6.79	-3.57	0.67	
This study also reported that diversifying acquisitions earned higher returns than related acquisitions. The authors also document that the returns of both the targets and acquirers are lower than those in unregulated industries. The authors attributed this result to the unique characteristics of utility companies.					
Burns et al (1998); 1981-1993	US utilities		3.90 for horizontal and 1.10 for diversifying M&A		3.60 for horizontal and 0.80 for diversifying M&A
This study document that in the long run bundled acquisitions where utilities in different operating lines merge have higher gains compared to horizontal acquisitions. This result is inconsistent with corporate focus theory <sup>32</sup> in unregulated industries. The authors attributed this result to the fact that regulations placed on utilities force value maximising managers to seek out acquisitions of other utilities outside their own primary business.					

<sup>32</sup> Corporate focus theory suggests that focus increasing acquisitions lead to significant increase in shareholder wealth compared to focus decreasing acquisitions in unregulated industries (Burns et al, 1998).

Berry (2000); 1995-1998	US utilities	9.925	-1.457'	1.693	This study also compared electric/electric mergers with gas/electric mergers and the result showed that the market reacted more positively to gas/electric mergers. This study also compared US domestic electric utilities mergers with US cross border electric utilities mergers of UK and Australian utilities. The study reported that US cross border acquirers did not incur significant wealth losses.
Leggio and Lien (2000); 1983- 1996	U.S utilities	9.55	-0.25	0.8827 for non- diversifying and -1.438 for diversifying acquirers	This study document that diversifying electric utilities' targets and acquirers earned higher returns than non-diversifying utilities. However combined gain is lower for diversifying M&As. This study also looked into a control sample of non regulated industries' M&As and document that M&As of utilities earned lower returns than M&As in non-regulated industries. The authors attribute this result to the regulatory environment in which utilities operate requiring regulatory approval to engage in M&As.
Becker-Blease et al (2008); 1992- 2002	U.S utilities	11.61 and 19.53	-1.29 and - 1.31	.95 and 2.34	This study also reported that the combined returns for the focused mergers are higher than diversifying mergers. Moreover this study also analysed the short run BHARs following merger completion and reported significant negative returns to the shareholders. The authors concluded that in the US context mergers are not effective in creating efficiency and synergy in the post deregulation period.



#### ***2.3.4.1 Summary and implications***

The results obtained in this Section on shareholder wealth creation following M&A of utilities are exclusively based on the US studies. The results show that similar to studies in non-regulated industries the empirical evidences on M&A in the regulated US electricity sectors also revealed that target shareholders gained while the acquirer shareholders suffered losses. However the level of target gains were lower compared to non-regulated industries. In general the authors attributed this lower target gains to the regulated nature of the electricity sector. However since the regulatory regimes are different in the US, the UK and continental Europe so it cannot be assumed that the results on shareholder wealth creation following M&A by the US electricity companies will also apply in the case of M&A of different utility companies in Europe. Moreover all the US studies on M&A in utilities are based only on the electricity sectors. In this study I will therefore examine the stock price performance following M&A of different European utility sectors like the electricity, gas, water and telecommunications.

#### **2.3.5 Determinants of the short run and long run shareholder returns**

The general review of M&A literature in finance on the short run and long run stock price performances in Subsections 2.3.2 and 2.3.3 has revealed a variety of profitability drivers. Specifically these studies have examined the correlation between the shareholder returns with the type of M&A event that is announced. These studies have examined the correlation by taking the returns accrued to the shareholders both



in the short run following the announcement of M&A as well as in the long run following the completion of M&A.

Firstly some studies have distinguished between domestic and cross-border M&A. These studies reported that shareholder returns are higher for domestic M&A compared to cross-border M&A (Cybo-Ottone and Murgia, 2000; Corhay and Rad, 2000; Lowinski et al, 2004; Campa and Hernando, 2004; Conn et al, 2005). Empirical studies have provided several reasons for this outcome. Campa and Hernando (2004) attributed the lower acquirer *CARs* in cross-border mergers to the existence of cultural, legal and transaction barriers that prevails across different countries. Campa and Hernando also suggested that the acquirer shareholders are penalised for embarking in M&A in a foreign country. This is because the market perceives that the acquirer pays too much under cross-border M&A. Corhay and Rad (2000) attributed the lower returns in cross-border M&As to the difference in corporate governance structure that prevails across different countries. On the other hand Lowinski et al (2004) suggested that if European market is well integrated then there would be no difference in shareholder returns between domestic and cross-border M&A. However if the result shows that shareholders earn higher returns in cross-border M&A then that would suggest that there are imperfections in product and capital markets. Some studies also suggested that imperfect capital market would allow firms to exploit favourable exchange rate movements by moving operations into other countries or by acquiring foreign firms (Froot and Stein, 1991 and Kang 1993; cited in Goergen and Renneboog, 2004). Imperfect product market would allow firms to capture rents that are not competitively priced. In both these cases shareholder value increase will be higher in cross-border M&A compared to domestic M&A.

Secondly, the review of empirical studies in Table 2.2 and Table 2.3 also revealed that most of the studies have reported lower returns for diversified<sup>33</sup> M&A compared to related<sup>34</sup> M&A (Maquiera et al, 1998; DeLong, 2001; Doukas et al, 2002; Megginson et al, 2004). Previous studies have attributed this result to agency issues. It is believed that under diversification excess cash flows are wasted on value decreasing lines of business (Doukas et al, 2002). Another reason for diversification is managerial optimism where the latter believe that their skills will be easily transferable to a different industry (Doukas et al, 2002). Furthermore creating or exploiting market power is also considered another reason for an increase in shareholder value under related mergers (Maquiera et al, 1998).

However extant studies on M&A in utilities showed that the market reacted more positively for diversifying M&A compared to non-diversifying M&A (Bertunek et al, 1993; Burns et al, 1998; Berry, 2000; Leggio and Lien, 2000). A number of interpretations of this result have been provided in the empirical literature on M&A in utilities. First the empirical evidence attributed this corporate focus anomaly to the fact that regulations placed on utilities force value maximising managers to seek out acquisitions of other utilities outside their own primary business rather than horizontal acquisitions (Burn et al, 1998). Secondly these gains primarily occur because of the attractiveness of “one-stop” shopping for energy services, overlap in distribution territories, and opportunities for information arbitrage, for example enabling electric utilities to learn from deregulation experiences of natural gas utilities (Berry, 2000). Leggio and Lien (2000) further found that the nature of a regulated industry and the

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<sup>33</sup> Diversified M&A refers to M&A taking between firms operating in different lines of business.

<sup>34</sup> Related M&A refers to M&A between firms that produce similar products and services (Hitt et al, 2003).



fact that mergers require approval from regulators as well as shareholders also contribute to this result.

Thirdly the empirical literature reported that target and acquirer shareholder returns are positively related to the relative size of the acquirer to target firms (Franks and Harris, 1989; Sudarsanam et al, 1996; Cakici et al, 1996; Fuller et al, 2002; Campa and Hernando, 2004; Goergen and Renneboog, 2004). Relative size refers to the ratio of the market value (MV) of the acquirer to the market value of the target firm<sup>35</sup>. Sudarasanam (1996) reported that a positive relation between relative size and shareholder returns suggest that when the target is smaller than the acquirer the latter is more willing to pay a higher premium. Moreover these studies also attributed this positive relation to the fact that the smallness of the target enables it to be more easily integrated with the acquirer.

Fourthly the M&A literature has labelled the firms with low book to market ratio<sup>36</sup> (a high stock price relative to book value) as growth firms or glamour firms (see Footnote 30, p.58) and firms with high book to market ratio (low stock price relative to book value) as value firms (Fama and French, 1992; Rau and Vermaelen, 1998; Sudarsanam and Mahate, 2003). Fama and French (1992) found that there is a significant relationship between book to market ratio and realised returns. Rau and Vermaelen (1998) in the context of US M&A and Sudarsanam and Mahate (2003) in the context of UK M&A have reported that value acquirers outperformed glamour acquirers. They attributed this result to the performance extrapolation hypothesis

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<sup>35</sup> Some studies have also taken the ratio of target MV to acquirer MV as relative size, e.g. Sudarsanam and Mahate (2003).

<sup>36</sup> Some studies like Fama and French (1992, 1993) have used book to market ratio while other studies like Rau and Vermaelen (1998) and Sudarsanam and Mahate (2003) have used market to book ratio.



(Footnote 29, p.58). This hypothesis relates to the over-optimism or hubris of the managers of growth firms. Due to this over-optimism the managers of these growth firms overestimate their abilities to manage a firm. On the other hand managers of value firms (low MTBV) are more prudent in approving an M&A. So M&A of these firms are not motivated by hubris and they create value from M&A instead of destroying it.

#### ***2.3.5.1 Summary and implications***

This Section has reviewed the empirical studies of the determinants of shareholder returns. However most of these determinants of shareholder returns have been examined in the context of M&A in non-regulated industries. The deregulation of European utility sectors has removed the barriers to entry in these sectors. Due to this reason M&A in utility sectors have taken place beyond national borders. One aim of this research is therefore to examine whether the shareholder returns are higher for domestic mergers of utilities compared to cross border mergers. Moreover many of the utility firms have merged with firms in a different line of business, for instance electric companies merging with gas companies. Therefore I aim to examine whether related M&A of utilities would generate larger operational synergies compared to cross-border M&A. This result is likely to bear important implications from the standpoint of the investors of utilities who wish to adopt the strategy of domestic and/or cross-border M&A. Moreover the studies of Rau and Vermaelen (1998) and Sudarsanam and Mahate (2003) have examined the performance extrapolation hypothesis in the context of non-regulated industries. Their results therefore could not be generalised for regulated industries like utility sectors. Hence I will examine the

performance extrapolation hypothesis in the context of M&A in European utility sectors. Further discussion on the choice of explanatory variables to examine the determinants of shareholders returns is given in Chapter 4.

## **2.4 Motives behind M&A: Theory and implication**

As outlined in Chapter 1 one of the purposes of this thesis is to examine the motives behind M&A of European utilities. Finance theory documents that there are three predominant motives behind mergers and acquisitions: synergy, agency and hubris (Bradley et al, 1988; Berkovitch and Narayanan, 1993; Seth et al, 2000; Lowinski et al, 2004; Goergen and Renneboog, 2004). In this thesis I propose to test these theories on the motives behind M&A in the context of M&A of European utilities. So in this Section I discuss the theory underlying these three motives behind M&A.

### **The Synergy hypothesis**

The synergy hypothesis proposes that acquisitions take place when the value of the combined firm is expected to be greater than the sum of the value of individual firms (Bradley, Desai and Kim, 1988; Seth, 1990). So under synergy motive the combined gains of the shareholders of target and acquirer firms following the announcement of M&A will be positive (Berkovitch and Narayanan, 1993; Seth et al, 2000; Goergen and Renneboog, 2004). Hitt et al (2003) had identified four sources of synergy.



**Table 2.5 Sources of synergy**

Sharing: Operational relatedness between businesses	High	Corporate relatedness: transferring skills into business through corporate headquarters	
		Low	High
		Related constrained diversification Vertical integration (market power)	Both operational and corporate relatedness (rare capability, can create diseconomies of scope)
	Low	Unrelated diversification (financial economies)	Related limited diversification (economies of scope)

Source: Hitt et al; 2003, p.188

The rationale behind synergy generation in each of the quadrant as postulated by Hitt et al (2003) is explained as follows.

*High operational relatedness and low corporate relatedness:* In these M&A synergy is generated through economies of scale and scope by exploiting the operational relatedness between organisations. Many extant studies have termed this synergy as operational synergy (Sudarsanam et al, 1996; Weston et al, 2001). This kind of synergy requires an overlap between products, activities and markets of the merging firms. In other words these M&As create the scope for vertical integration. Therefore firms that want to increase their market power typically embark upon this type of M&A.

*Low operational relatedness and high corporate relatedness:* In this quadrant M&A take place between unrelated industries; for instance mergers between two conglomerates. Therefore in these M&A synergy is created from non-operational sources like managerial or financial synergy. Managerial synergy refers to cases where a more competent acquirer management takes over a target with less competent



managers. Financial synergy on the other hand is generated through M&A by matching the availability of investment opportunities and internal cash flows.

*High operational relatedness and high corporate relatedness:* This kind of M&A creates opportunity for both operational and corporate relatedness as previously discussed. Thus it allows greatest potential for value creation.

*Low operational relatedness and low corporate relatedness:* Since in this quadrant there is no relatedness therefore here synergy is created in the form of financial economies alone. This refers to the cost savings realised through allocative efficiency.

### **Agency or the managerialism hypothesis**

The agency motive suggests that takeovers are primarily motivated by the self interest of the managers of the acquiring firms. Extant studies have advanced several reasons behind this motive. These are diversification of the management's personal portfolio (Amihud and Lev, 1981), use of free cash flow to increase the size of the firm (Jensen, 1986), and acquiring assets that increase the firm's dependence on the management (Shleifer and Vishny, 1986). Amihud and Lev (1981) showed that managers of the firms engage in conglomerate mergers to reduce their employment risk. In conglomerate mergers a portfolio of businesses are created each of which possesses a different profile of risk and reward with the aim of reducing the total business risk. Jensen's free cash flow hypothesis suggests that managers prefer to use the free cash flows of the firms in M&A rather than paying it out to the shareholders. Marris (1964) cited in Seth et al (2000) also postulated that managerial compensation is frequently tied to the amount of assets under their control, so managers like to seek higher rates of growth in assets rather than profits. Since all of these M&A take place due to the

managers personal benefit at the cost of the benefit of the firm, therefore most of these M&A are argued to destroy value. This is because the managers knowingly overpay in takeovers as they embark on acquisitions to maximise their own utility at the expense of their firm's shareholders (Seth et al, 2000; Berkovitch and Narayanan, 1993; Fernandez and Baixauli, 2003). Moreover the target shareholders realising their value to the acquirer management try to extract a higher premium by using their bargaining power. This leads to even greater losses to the acquirer shareholders. As a result under agency motive combined gains of the target and acquirer firms are negative (Berkovitch and Narayanan, 1993; Seth et al, 2000).

### **Winner's curse or hubris hypothesis**

The hubris hypothesis first coined by Roll (1986) maintains that acquisitions are motivated by managers' mistakes due to overconfidence and that there is no synergy gain from takeovers. Managers of the bidding firms engage in takeovers because they overestimate the target firm's assets. Roll (1986) attempted to interpret the empirical results from various extant studies in terms of the hubris hypothesis. This study took previous empirical evidence about target firms, total gains and acquirer firms to draw support for the hubris hypothesis. Moreover the author also documents that under hubris M&A result in a transfer of wealth from acquirer shareholders to target shareholders. So the gains to the target shareholders emanate from the losses of the acquirer shareholders resulting in a zero combined gain.

This Section has presented the theoretical arguments behind synergy, agency and hubris motives behind M&A as postulated by different extant studies. From the



discussion of the theories behind takeovers it is apparent that value destroying takeovers emanate from either agency motive or hubris. But the difference between agency and hubris hypotheses lies in the fact that under agency theory value destruction from M&A take place intentionally by the managers while in hubris this is not intentional.

In Section 2.2 earlier I reviewed some extant studies that examined the motives behind M&A of utilities. However none of these studies have formally attempted to ascertain the presence of any or all of these motives in the context of M&A of European utilities. Since utility sectors are regulated the profitability of these sectors are constrained in several ways by the regulators. Despite this fact there has been a surge in M&A in European utility sectors after the mid 1990s. In this context one of the objectives of this thesis is to examine the motives behind these M&A. This analysis might have important policy implications as in future antitrust/competition authorities (see Section 1.3, p.11 for definition) might be more vigilant before approving undesirable mergers (that is merger which are motivated by agency or hubris). Extant studies have document several ways to determine the synergy, agency and hubris motives behind M&A. In Sections 2.4.1 and 2.4.2 below I review the empirical evidence on the motives behind M&A.

#### **2.4.1 Combined gains of target and acquirer shareholder following the announcement of M&A: Theory and Empirical evidence**

In the previous Section I have discussed the theory and implications of the three predominant motives behind M&A: synergy, agency and hubris. Empirical studies on



the motives behind M&A have applied two different methods to examine the motives. The first method is the combined gains approach and second method is based on correlation analysis. The purpose of this Section is to review the empirical evidence based on the combined gains method to examine the motives. Subsection 2.4.2 next will discuss the studies based on the second method.

The seminal paper of Bradley et al (1988) defined the combined gain from M&A as the sum of the change in wealth of the shareholders of the target and acquiring firms. So the combined gains figure reveals the sum of shareholder value creation of the target and acquirer firms following the announcement of M&A. This is calculated as the weighted average of the total gains accrued to the shareholders of the target and acquirer firms surrounding the M&A announcement date. The weights are the market values of the firms prior to announcement date. As discussed in the previous Section the combined gains will be positive, negative or zero when the motive behind M&A is synergy, agency and hubris respectively.

In Section 2.3.2 earlier I have reviewed the empirical evidence on the stock price performance of the shareholders of the acquirer and target firms following the announcement of M&A. Some of the extant studies in Section 2.3.2 have also examined the combined gains of the target and acquirer shareholders. In Table 2.6 I have documented the result of these extant studies on the combined gains (or losses) to shareholders following M&A.

The general consensus from these studies is that synergy is the predominant motive behind M&A in non-regulated industries both in the context of US M&A as well as

European M&A. This is evidenced from the positive combined gains accrued to the shareholders. The US studies on M&A have reported the total gains in units of currency (million dollars). The synergy motive has also been reported by the literature on M&A of the US electricity sector (Bertunek et al, 1993; Berry 2000; Becker-Blease et al, 2008). However there is no evidence whether this empirical regularity in the market for mergers and acquisitions also holds for different utility sectors in Europe.

It may be argued that due to the social welfare characteristics of utility sectors it is important that they merge only to generate synergies. Mergers that do not generate synergies are likely to be seen as undesirable from a policy perspective for any sectors but this is even more undesirable for utility sectors due to the nature of services that they deliver. Hence in this thesis I intend to examine whether M&A of utilities by European acquirers are motivated by synergy. This analysis has a vital significance from public policy perspective. This is because if the findings of this thesis show that M&A of European utilities are motivated by agency or hubris then regulators of utilities need to be more vigilant in approving M&A.

Table 2.6: Summary of studies on combined gain following the announcement of M&A					
Study; sample period	Cumulative abnormal returns	Total gain (in million dollars)	% positive returns	Country/Domestic or cross border	Notes
Panel A: Evidence from UK and continental Europe					
Sudarsanam et al (1996); 1980-1990	2.34%			U.K Domestic	The study concluded that mergers have increased the value of the shareholders' wealth on average. However since the targets gained and acquirers suffered losses so the authors concluded that the mergers led to a transfer of wealth from acquirers to target firms.
Cybo-Ottone and Murgia (2000); 1988-1997	4.03%		67%	13 European banking industry	This study concluded that there has been a significant increase in shareholder wealth following European banking mergers.
Fernandez and Baixauli (2003); 1990-1998	1.17%		57.4%	Spain	The result on combined gain suggested that synergy is the predominant motive behind these acquisitions
Panel B: Evidence from US studies					
Bradley et al (1988); 1963-1984	7.43%	117.11	75%	US tender offers	The study concluded that successful tender offers generated synergistic gains leading to a more efficient allocation of corporate resources
Eun et al (1996); 1979-1990		68.18	67%	US targets and cross-border acquirers	The result showed that combined dollar gains are positive for Japanese and Canadian acquirers sample but negative for the sample of UK acquirers implying presence of synergy only for Japanese and Canadian acquirers



Gupta et al (1997); 1979-1992	3.5	US	This study reported that combined gains were more in the post-FIRREA period compared to the pre-FIRREA period.
Seth et al (2000)	249.5	US target and cross border acquirers	This study reported synergy from cross-border acquisitions
Mulherin and Boone (2000); 1990-1999	3.56%	US	The authors attributed this positive wealth gain to synergistic theory of corporate restructuring
Delong (2001); 1988-1995	0.04%	US mergers in which at least one party is a bank	The study reported that focussed mergers are more value enhancing than diversifying mergers
Houston et al (2001); 1985-1996	1.86%	US bank mergers	This study reported that the estimated value gains from bank mergers stem from the opportunity to cut costs by eliminating overlapping operations.

### 2.4.2 Synergy, Agency or Hubris?

In this Section I discuss the empirical evidence on the motives behind M&A in non-regulated industries based on the method proposed by Berkovitch and Narayanan (1993). This method examines the motives behind M&A by analysing the correlation between target gain (TG) and total/combined gains (CG) and between TG and acquirer gains (AG). Berkovitch and Narayanan (1993) documented that in this method the simultaneous presence of two or more motives behind M&A for a sample of firms can be determined. The combined gains method discussed in the previous Section only determined the presence of any one motive behind M&A. Therefore Berkovitch and Narayanan (1993) argued that only examining the combined gain might not provide a true picture of the motives behind M&A. They had put forward that even if total gain is positive for a sample of takeovers the acquirer gains might be negative for many of the firms in the sample. As indicated in Section 2.4.1 earlier synergy motive implies that there should be positive gains for both acquirer and target shareholders therefore negative acquirer gains will suggest presence of either hubris or agency motive along with synergy motive for such a sample of takeovers. Table 2.7 shows the expected sign of correlation in the presence of the three motives behind M&A which are synergy, hubris and agency. The rationale and implication of this Table as outlined in Berkovitch and Narayanan (1993) and later by Seth et al (2000) has been discussed in detail in Chapter 4.

**Table 2.7 Theory of gains behind M&A**

	<i>Correlation between target gain and total gain</i>	<i>Correlation between target gain and acquirer gain</i>
<i>Efficiency or synergy</i>	+	+
<i>Hubris (winner's curse, overpay)</i>	0	-
<i>Agency or managerialism</i>	-	-

Source: Berkovitch and Narayanan (1993)

This classic model of Berkovitch and Narayanan (1993) for tests of M&A motives is later followed by several studies in the M&A literature both in the US and Europe. I have reviewed these studies in Table 2.8 below. Evidence from these studies show that synergy is the predominant motive behind M&A. However most of these studies have also reported presence of either agency or hubris or both along with synergy for their respective samples of M&A. But all of these studies have examined the motives behind M&A in the context of non-regulated industries. Therefore this thesis aims to extend this analysis in the context of M&A of utilities. The rationale for this analysis has been discussed further in Chapter 3.



Table 2.8 : Review of evidences on the motives behind M&A						
Study, Sample period	Correlation between TG and CG	Correlation between TG and CG in the positive total gain sub-sample	Correlation between TG and CG in the negative total gain sub-sample	Correlation between TG and AG	Country	Notes
Panel A: Evidence from European studies						
Fernandez and Baixauli (2003); 1990-1998	Positive implying synergy	Positive implying synergy	Positive suggesting synergy	Negative in both the sub samples suggesting presence of hubris motive	Spain	The authors suggested that agency motive did not appear in the results because internal control mechanisms predominated in the Spanish corporate control market.
Goergen and Renneboog (2004); 1993-2000	Positive implying synergy	Positive implying synergy	Zero suggesting presence of hubris	Negative in both the sub samples suggesting presence of hubris motive	18 European countries	This study looked into the motives behind M&A by calculating the correlation both on the event day and over a longer event window of (-10, 0).
Panel B: Evidence from US studies						
Berkovitch and Narayanan (1993); 1963-1988	Positive implying synergy	Positive implying synergy	Negative suggesting agency motive	Negative in both the sub samples suggesting presence of hubris motive	US	The study also found that multiple bids are motivated by agency rather than synergy motives
Gupta et al (1997); 1979-1992		Positive implying synergy	Negative suggesting agency motive	Positive in the positive total gain sub-sample suggesting hubris motive	US	The authors concluded that the changes in acquisitions environment in the post-FIRREA period did not change the motives behind these acquisitions.
Seth et al (2000); 1981-1990		Positive implying synergy	Negative suggesting agency motive	Negative in the positive total gain subsample with negative acquirer gains thereby suggesting hubris motive	US target and cross border acquirers	This study found that positive total gains or negative total gains are independent of whether a bid is characterised by a bidding contest or not.

## **2.5 Summary and discussion**

In this chapter I have reviewed two strands of literatures firstly on utility sectors and secondly on M&A.

The review of literature on the deregulation of utilities provided a background to the nature of utility sectors and how utility sectors in Europe transformed from state owned enterprises to privatised entities. I have also reviewed the empirical studies that have examined the performance of utility sectors following privatisation and deregulation. This review highlighted the importance attached to utility sectors, and helps explain why research on these sectors requires serious consideration.

The discussion of empirical studies of M&A in utility sectors across Europe revealed that all of these studies are based only on the electricity sectors. Moreover this review also brought to light the lack of study on M&A of European utilities from a finance theory perspective. Hence the gap in literature that has evolved from this review is to examine the change in shareholder wealth following M&A in European utility sectors. Moreover this review also showed that there is no evidence on the motives behind M&A of utilities from a finance theory perspective. I have presented the research questions on the basis of these gaps in the next Chapter.

In Section 2.3 I have presented the existing studies on the stock market performance following M&A. The key issue that emerge is that there is no evidence on the stock market performance following M&A in utility sectors by European acquirers. From this review I have documented that there is some evidence on M&A in the electricity



sectors based on the US studies. These studies revealed that the returns earned by both the target and acquirer shareholders following the announcement of M&A were lower compared to those reported by the extant studies in the non-regulated industries. These studies have attributed these lower shareholder returns to the regulated nature of the electricity sectors. However since the nature of regulation in Europe differs from that in the UK so this result cannot be generalised in the context of M&A of European utilities. So study of M&A of European utilities requires separate examination.

Finally in Section 2.4 I have presented the theory and empirical evidence on the motives behind M&A from a finance theory perspective. This review revealed the methodologies applied by the empirical studies to examine the motives behind M&A. The general consensus from these studies showed that synergy is the predominant motive behind M&A in non-regulated industries. There is however no evidence on the motives behind M&A of European utility sectors. It is vital to examine the motives behind M&A of European utilities given the regulated nature of utility sectors along with their social and economic significance. Hence in this thesis I aim to examine the motives behind M&A of European utility sectors.

In the next chapter I will discuss the key issues and observations of the literature that I have presented in this chapter. I will also present the formal research questions that this thesis will address.



## **Chapter 3**

### **Gap in literature and research questions**

#### **3.0 Introduction**

As outlined in the previous Chapters the aim of this research is to examine the performances of European utility sectors following M&A from a finance theory perspective. Hence this research is situated between literature surrounding utility sectors on the one hand and finance literature on mergers and acquisitions on the other. For this reason in Chapter 2 I have reviewed two strands of literatures first on utility sectors and second on M&A literature in finance. From this review some key issues and observations have emerged. In Section 3.1 below I discuss these critical issues and observations and thereby I discuss the gaps in these studies.

In Section 3.2 I present the research questions and discuss their respective hypotheses. Three research questions will be raised in this section. All of these research questions relates to an examination of M&A from a finance theory perspective but in the context of M&A of European utilities. Finally Section 3.3 concludes.

#### **3.1 Critique of extant studies and gap in literature**

In this section I discuss the critical observations and issues that have emerged from the review of literature in Chapter 2 and thereby I highlight the gaps in this literature.

- 1) The review of literature on privatisation, deregulation and liberalisation of utility sectors across Europe provided a background on how and why these utility sectors were transformed from state owned enterprises to privatised utilities. Some of these studies have examined the outcomes of privatisation and they reported that privatisation led to a reduction in costs and prices (Newbery, 1997; Parker, 1997; Parker, 2003; Florio, 2007) and higher returns to the shareholders (Parker, 1997; Dnes et al, 1998). Jones (2001) captured to some extent the public policy debate in the UK surrounding the privatisation of utility sectors. This review demonstrated the plurality of studies that exist on the privatisation and deregulation of utilities. From this review of studies it is apparent that utility sectors are of great significance for various stakeholders like the consumers, the investors and the politicians and so study of utilities deserves important consideration.
- 2) In Section 2.2 of Chapter 2 I have reviewed the studies that have examined the mergers and acquisitions of utilities across Europe following privatisation and deregulation. A number of key issues emerged in this Section from the review of empirical evidences on the motives behind M&A of utilities. Firstly most of these studies have examined M&A only in the electricity sector. Since the rise in M&A in Europe has taken place across all the four utility sectors (i.e. electricity, gas, water and telecom) so this requires examination of the performances of all the utilities following their M&A. Secondly the study of Ghobadian et al (1999) and Ghobadian and Viney (2000) examined the motives behind M&A in utility sectors from strategic perspective. Therefore there is a lack of a similar study on the motives behind M&A of utilities from a finance theory perspective. Finance theory postulated three predominant motives behind M&A, which are synergy,



agency and hubris motives, and the empirical studies in finance have examined a sample of M&A in terms of these three motives. However there is no evidence on the motives behind M&A of European utilities on the basis of these three motives. Thirdly from the review of these studies I deduce that there is also a lack of empirical evidence on shareholder value creation following M&A of these utilities in Europe. Examination of shareholder wealth creation is central to the study of M&A in finance. Although the study of Freytag et al (2005) has examined change in shareholder wealth creation following M&A, this study has only examined the German energy utility targets. Fourthly none of these studies has examined the M&A of European utilities taking a very recent sample. Freytag et al's sample of German-US energy companies' M&A ends in 2002. Therefore as discussed in Section 1.0 of Chapter 1 the growing trend of M&A in different utilities by European acquirers also makes it timely to examine the performance of these sectors following M&A.

- 3) The survey of evidence in the finance literature on shareholder wealth creation both in the short run and long run revealed that these studies are largely based on non-regulated industries. This is given in Section 2.3 of Chapter 2. For instance Campa and Hernando (2004) examined the short run announcement period change in shareholder wealth of the target and acquiring firms. In this study they partitioned their sample into regulated and non-regulated industries and found that returns to target and acquirer shareholders were lower in regulated industries compared to non-regulated industries. However this study did not include utilities separately within their analysis of regulated industries. Goergen and Renneboog (2004) looked into regulated industries separately but these consisted of only nine



firms which is hardly a representative sample. They found that acquirers in energy and financial sectors earned even more negative cumulative abnormal returns (CAR)<sup>37</sup> than other industries included in their analysis. However since the number of regulated firms examined in this study is small therefore this result should be considered with care. Moreover none of these studies have examined the long run post acquisition returns of the shareholders following the completion of M&A. Thus there is no empirical evidence on shareholder wealth creation following M&A in all the different utility sectors. Hence in this thesis I shall extend this analysis of shareholder wealth creation in the context of M&A of European utility sectors.

- 4) From the review of long run studies on post acquisition performance in Section 2.3.3 it is clear that most of these studies have reported negative returns for the combined firm shareholders. There are some issues that emerge from the review of these long run studies. As discussed in Chapter 4 there are some methodological debates associated with the buy and hold abnormal returns (*BHAR*). Fama (1998, p.283) also reviewed a set of past studies that examined the long-term abnormal performance following corporate events (such as IPO, mergers, stock-split) and concluded that “consistent with the market efficiency hypothesis the anomalies are chance results, apparent overreaction of stock prices to information is about as common as under-reaction”. Despite these arguments some studies on long run performance (like Rau and Vermaelen, 1998) have reported long run negative returns. However none of these studies have examined the long run returns in the context of M&A of European utilities. Hence in this

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<sup>37</sup> Cumulative abnormal returns (CAR) are abnormal returns that are cumulated over some specified event days (MacKinlay, 1997). Detail discussion is given in Chapter 4.

study I will extend this empirical evidence on long run post acquisition performance in the context of M&A of European utilities.

- 5) From the review of literature in Section 2.3 it is also apparent that there a small number of studies that have examined shareholder wealth creation following M&A in utility sectors. These studies are based on M&A in the US electricity sector. As I have mentioned earlier in Chapter 2, since the nature of regulation in utility sectors is different in the US and Europe so it cannot be conjectured that the US evidence on M&A will also hold in the context of M&A of European utilities. Moreover the US evidence is only based on electricity sector. Therefore there is clearly no evidence on shareholder wealth creation following M&A by examining all utility sectors. Since deregulation of utilities in Europe has encompassed all the different utility sectors so this calls for a need to examine M&A of all these utility sectors. So in this thesis I intend to study M&A of all the different utility sectors.

From the discussion so far it is apparent that there is a lack of evidence on shareholder wealth creation following the M&A of different European utility sectors. Hence the *first objective* of this research is to examine the shareholder wealth creation following M&A of European utility sectors both in the short run following the announcement of M&A as well as in the long run following the completion of M&A.

- 6) Furthermore the empirical studies on M&A have shown a number of drivers of shareholder returns. From the evidences on determinants of shareholder returns in Section 2.3 of Chapter 2 it is apparent that all of these explanatory variables have been examined in the context of M&A in non-regulated industries (except for



related versus diversified M&A which has been examined in the context of M&A of US utilities). Thus there is a lack of evidence on these determinants or drivers of shareholder returns in the context of M&A by European acquirers of utilities. The short run announcement period returns and the long run post merger returns that I intend to examine in this thesis will show the extent of gain or loss accrued to the shareholders. However in order to analyse the sources of these wealth creations it is essential to examine the determinants or drivers of these shareholder returns. This is the *second objective* of this thesis.

- 7) In Section 2.4 of Chapter 2 I have described that theory and empirical literature in finance have put forward three theories behind M&A which are synergy, agency and hubris. A small number of empirical studies in finance have examined the motives behind M&A on the basis of these three theories. The review of studies on the motives behind M&A demonstrates that the finance literature has used two different methods to examine the motives behind M&A. In the first method the motives have been examined by evaluating the combined gains accrued to the shareholders of the target and acquirer firms following the announcement of M&A. In the second method the motives have been examined by looking at the correlation between target gain and total gain and the correlation between target gain and acquirer gain. Most of the empirical evidence based on these two methods showed that synergy is the predominant motive behind M&A. However from the review of studies on the motives behind M&A it is apparent that none of these studies have examined the motives behind M&A of utility sectors from the perspective of the finance literature. Since utility sectors are guided by public interest consideration so it is important for a variety of reasons that mergers in



these sectors take place in order to generate synergies. Thus the *third objective* of this thesis is to examine the motives behind M&A of different European utility sectors by applying these two methods.

### 3.2 Research Questions

On the basis of the gaps in the existing studies that I have discussed in the previous section I shall now present the research questions that this thesis will examine. The three research questions are given as follows.

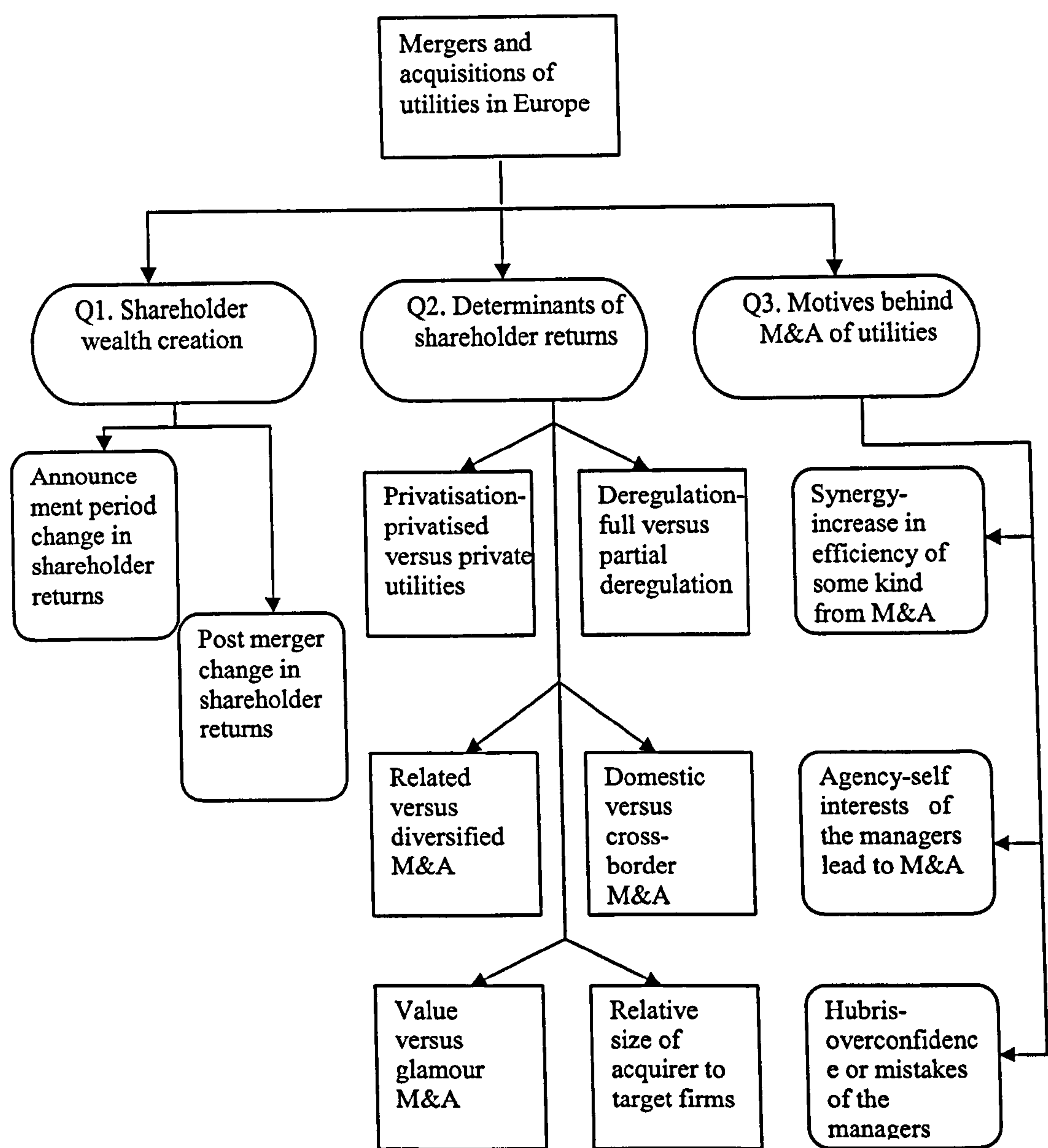
Q1: What are the (a) short run and (b) long run wealth effects on the European utility companies that were engaged in M&A? Wealth effect of the utility companies will be examined (a) in the short run following the announcement of M&A and (b) in the long run following the completion of M&A?

Q2: What are the determinants of shareholder returns?

Q3: What are the motives of the utility companies to engage in M&A?

Figure 3.1 below depicts these three research questions. The rest of this Section which provides a detailed discussion of these research questions are structured as follows. Subsection 3.2.1 presents research question Q1 and the testable hypothesis pertaining to this research question. In similar lines Subsection 3.2.2 discusses research question Q2. Finally Subsection 3.2.3 confers research question Q3 and the various hypotheses related to it.

**Figure 3.1 Illustration of the research questions**



The three research questions are illustrated above. As the figure shows, the first research question aims to examine the shareholder wealth creation following M&A. The boxes in the figure under shareholder wealth creation represent the two measures (short run announcement period change in shareholder returns as well as the long run post acquisition period change in shareholder returns following the completion of M&A) needed to answer this question. The purpose of the second research question is to address the determinants of shareholders' value creation following M&A, and here

the boxes represent the different deal characteristics upon which I have analysed the determinants of shareholder returns. In addition as the boxes depict two new explanatory variables privatisation and deregulation specific to utility sectors have been included in this study to examine the determinants of shareholders returns. The rationale behind inclusion of these deal characteristics are given in Subsection 3.2.2 below. Finally the aim of research question Q3 is to determine the motives behind M&A of European utility sectors. Existing theory and empirical literature in finance has postulated three predominant hypotheses behind M&A, and these are shown in the boxes under the research question Q3. Hence in this study I intend to examine the motives behind M&A of European utilities from the standpoint of these three distinct theories on merger motives.

### **3.2.1 Q1 (a): What are the short run wealth effects of the European utility companies that were engaged in M&A?**

This question will be answered on the basis of the theory of efficient market that I discussed in Chapter 2. The theoretical argument surrounding market efficiency suggests that if the capital market is efficient then the stock prices will incorporate any new information very quickly and effectively such that the stock price of a company at any time will reflect the market's best estimate (Fama, 1970). The short run event study methodology is based on this theory of efficient market. This is considered as the most reliable evidence statistically to gauge whether M&A create or destroy value for shareholders. Due to this reason as I have outlined in Section 2.3.1 of Chapter 2 the short run event study methodology has been widely accepted by researchers in corporate finance to determine change in shareholder wealth following



merger announcement. The extant studies that I have reviewed in Section 2.3.2 have all applied this short run event study methodology<sup>38</sup> to examine the short run wealth creation following announcement of M&A.

Therefore following this general consensus in this study I will apply this event study methodology to evaluate the abnormal returns (if any) that are accrued to the target and acquiring firms' shareholders following the announcement of a merger or acquisition. As discussed in Section 2.3 of Chapter 2 the theory of market efficiency suggests that these abnormal returns will reflect the market's best estimate, of the present discounted value of cash flows that would actually be generated from the M&A (Cornell and Morgan, 1990).

The cumulative abnormal returns (CAR) will be calculated over different event windows extending several days surrounding the merger announcement day. To ensure the robustness of the results I will use three benchmark models to calculate the short run cumulative abnormal returns. These are the market model, the mean adjusted model and the world market model. The rationales behind inclusion of these three benchmark models are given in Section 4.2.1 of Chapter 4.

### *Hypothesis on the short run shareholder wealth creation*

As outlined in Chapter 1 in this research I hypothesize that in the short run following the announcement of M&A the abnormal returns accrued to the target and acquirer shareholders will be lower compared to that reported by empirical studies in non-

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<sup>38</sup> The detail explanation on the working of the short run event study methodology has been discussed in the next chapter.

regulated industries. These lower abnormal returns would be due to the regulated nature of utility sectors (Leggio and Lien, 2000). Due to the social welfare characteristics of utility sectors the regulators of these sectors need to ensure that these sectors do not earn supernormal profits (Vickers and Yarrow, 1988). Due to this reason the acquirer shareholders will be sceptical when asked to pay a higher premium for the targets as they might not be able realise these higher premiums after the mergers due to regulation.

In fact as discussed in the previous Chapters in the context of M&A in the US electricity sector Leggio and Lien (2000) and Becker-Blease et al (2008) also reported that the short run target and acquirers returns were lower than in non-regulated industries. These studies attributed this to the regulated nature of the electricity sector. In the context of US regulatory regime these studies argued that the regulators would disallow the acquirers to recover the premiums paid to the targets by passing it to the rate base. Even though the nature of utility regulation is different in the US and Europe nevertheless due to the very nature of utility sectors examined in this study I expect that the announcement period returns of target and acquirer shareholders will be lower than their counterparts in non-regulated sectors.

### **3.2.2 Q1 (b): What are the long run wealth effects of the European utility companies that were engaged in M&A?**

While the short run announcement period stock price performance would help to determine the expected returns from M&A, the realised returns could only be determined by examining the long run post merger stock price performance of the



combined entity. As discussed in Chapter 2 the proponents of long run post merger studies have justified the need of examining long run returns by arguing that short run announcement period returns might not fully capture the wealth effect from M&A. In addition most of the long run studies showed that the short run positive returns in the announcement period do not persist in the long run (e.g. Agrawal et al, 1992; Antoniou et al, 2007). In fact most of the long run studies have reported that in the post merger period the shareholders of the merged entities have earned negative returns. Extant studies have termed this difference in short run and long run result as post merger 'anomaly' (Agrawal, 1992; Fama 1998). This difference in returns between short run announcement period and long run post merger period might also hold true in the context of M&A of European utilities.

Moreover the long run post merger performance will also have important policy implications for future investors of European utilities who might consider embarking in M&A. Therefore one of the objectives of this thesis is to examine the long run post merger stock price performance of European utility companies that engaged in M&A.

The review of extant studies in Table 2.3 of Chapter 2 showed that long run post acquisition performances are typically examined for a period of three to five year after the completion of M&A. In this research I will analyse the long run returns three years from the M&A completion date. As many of European utility firms have completed their M&A very recently, five years post acquisition performance could not be analysed for all the firms in the sample.



This study will use two long run event study methods to ensure robustness of the results. These methods are Buy and Hold Abnormal returns (*BHAR*) and Calendar Time Abnormal Returns (*CTAR*). Detail description of *CTAR* and *BHAR* methodologies are given in Section 4.2.2 of Chapter 4.

### ***Hypothesis on the long run shareholder wealth creation***

In this study I hypothesize that the long run post merger change in shareholder returns of the combined European utility firms will be negative. This hypothesis emanates from the review of empirical studies on post acquisition performance where the majority of the studies have reported negative returns for the combined firms' shareholders. Moreover in the context of M&A of the US electricity sector Becker-Blease et al (2008) found that in the long run post merger period the shareholders of the merged entities have suffered significant wealth losses. Following these empirical evidences in both regulated and non-regulated industries in this study I hypothesize that the shareholders of merged entities will earn negative returns in the long run post merger period.

### **3.2.3 Q2: What are the determinants of shareholder returns?**

The first research question will answer the extent of gain or loss accrued to the shareholders in the short run and in the long run. However in order to examine the sources of these shareholder returns it is imperative to examine the determinants or the drivers of these shareholder returns. The objective of this research question is to examine the sources of these shareholder returns.

In order to determine the sources of shareholder wealth creation in this study I examine two regression models. In the first model I examine the sources of short run abnormal returns accrued to the shareholders of the target and acquirer utility companies. In the second regression model I examine the sources of long run abnormal returns earned by the shareholders of the merged entity in the post merger period following the completion of M&A. The purpose of these regression models is to investigate the short run and the long run abnormal returns with respect to six different characteristics of M&A. These six variables include privatisation, deregulation, degree of relatedness of utility mergers (for instance gas-electric merger or electric-electric merger), domestic versus cross-border M&A, the glamour status of the acquirers and relative size of acquirer to target firms.

***Regression hypothesis:*** The expected outcomes of the regression tests have been discussed as follows.

- First one of the objectives of this thesis is to analyse the change in shareholder wealth following M&A of European utilities from the time period starting from 1990 to 2006. This period also has witnessed the privatisation of utility sectors in most of the European countries. But all the European utility companies that engaged in M&A were not subjected to privatisation. Some of these companies were under private ownership since their inception. Hence in this thesis I aim to examine whether the shareholder returns are higher for those utility companies that were subject to privatization. This result might have important implications from the standpoint of the investors and regulators of M&A. This is because this result will reveal whether utility firms



that are subject to privatization are more adept to the strategy of M&A in terms of generating shareholders' wealth.

- Second this study examines whether the shareholders returns are explained by the level of deregulation of different utility sectors in different European countries. The extant studies in Chapter 2 showed that deregulation of utilities acted favourably for the shareholders as they earned higher returns (Parker, 1997; Dnes et al, 1998; Boardman and Laurin, 1998; Robinson and Taylor, 1998; Parker 2003, Florio, 2007). Hence in this research I posit that the market will respond positively towards M&A of those utilities which are fully deregulated in their respective home country. Another reason for this hypothesis is that M&A of utilities that operate in a partially regulated setting might not bring the investors their desired returns. This is because the investors might be under the pressure from the regulatory agencies. The regulators might cause a lengthy wait of regulatory review for the merger to be completed. Moreover the regulators might impose conditions on mergers which may further reduce potential increases in shareholder value. Furthermore the shareholders of the acquiring firms may have little incentive to take on the added risk associated with a merger (Leggio and Lien, 2000). This is because the regulator may disallow the recovery of premiums paid to targets. For this reason the acquirers will have no incentive to pay a premium over market value for a target. Due to these several factors the acquirer returns might be affected under partial or full regulation. So this study posits that the short run *CARs* and the long run combined *BHARs* will be positively related to deregulation.



- Third in this thesis I aim to examine whether shareholder wealth creation is higher for domestic or cross-border M&A. As discussed in Chapter 2 there are several extant studies that have examined these deal characteristics in the context of M&A in non-regulated industries. These studies have provided mixed arguments on the impact of this deal characteristic on shareholder returns. This study aims to examine this deal characteristic in the context of M&A of European utility sectors. Empirical studies on M&A of European utilities suggest that the small size of many European countries will prevent the generation of potential synergies from M&A under domestic mergers (Loredo and Suarez, 2000). Since utility sectors are large capital intensive industries so it is likely that the potential for synergy in terms of economies of scale and scope are higher for cross-border M&A in comparison to domestic M&A. Hence the testable hypothesis concerning this explanatory variable is that the market will react more favourably for M&A of European utilities under cross-border M&A compared to domestic M&A.
- Fourth I attempt to examine whether the shareholders' wealth creation are explained by the degree of relatedness of M&A in European utility sectors. Degree of relatedness here refers to whether the M&A has taken place within same sector (for instance electric-electric mergers) or different utility sectors (for instance gas-electric mergers). As discussed in Section 2.3.5 of Chapter 2 extant literature has reported two varying evidence of shareholder returns with respect to the degree of relatedness of M&A for regulated and non-regulated industries. In this thesis I intend to extend this case in the context of M&A of European utility sectors.

- Fifth from the survey of literature in Chapter 2 it has been identified that some extant studies have reported that shareholder returns are explained by the value or glamour status of the acquirers. Particularly these studies have showed that shareholders returns are higher for value acquirers compared to glamour acquirers in the long run post merger period (Rau and Vermaelen, 1998; Sudarsanam and Mahate, 2003). These extant studies attributed this phenomenon to performance extrapolation hypothesis. (Please refer to Footnote 29, p.58 of Chapter 2 for its definition). From the definition of performance extrapolation hypothesis it is apparent that if this hypothesis holds then it will imply that glamour acquirers have engaged in M&A due to managerial hubris. Therefore this is one way of determining hubris behind M&A. The extant studies also contend that the performance extrapolation hypothesis will hold in the long run post merger period because markets will take some time to reassess the quality of the acquirers. Therefore empirical studies suggest that the correlation between shareholder returns with respect to value versus glamour M&A will be positive in the short run and negative in the long run. In the thesis therefore I intend to examine whether this performance extrapolation hypothesis will hold in the context of M&A of European utilities.
- Sixth empirical studies have shown that relative size of acquirer to target firms acts as a proxy for acquisition risk (e.g. Sudarsanam et al, 1996; Campa and Hernando, 2004; Goergen and Renneboog, 2004). These studies hypothesized that when the target firms are smaller than the acquirers it assists in the post acquisition integration and thereby helps to realise the potential synergies from the mergers. Moreover the larger the target size the greater will be the



financial distress in case of failed acquisition. This thesis aims to examine this hypothesis in the context of M&A of European utilities.

This is first study that has attempted to examine whether shareholder wealth creation following M&A of European utility sectors are explained by the different characteristics of M&A. If the findings suggest any significant association of these different M&A characteristics with shareholder returns then it will have important policy implications for the investors of utilities. Specifically these findings might influence the investors in undertaking important strategic decisions pertaining to M&A of European utility sectors.

#### **3.2.4 Q3: What are the motives of the utility companies to engage in M&A?**

This question will be answered in the light of the three theories of motives behind M&A that has been postulated by the finance literature. These theories are synergy, agency and hubris. Following the empirical literature in finance discussed in this thesis I will use two different methods to examine the motives behind M&A. First the motives will be analysed by looking at the weighted average of the combined gains of the target and acquirer firms in the twenty one days event window surrounding the announcement date. The weights are the market values of the firms taken two months prior to the event announcement date. Following the definition of the three motives discussed in Section 2.4 of Chapter 2 this study would identify the presence of synergy, agency or hubris motives behind M&A of European utilities if the combined gain is positive, negative or zero respectively.



The second method that has been used to examine the motives follows from the model of Berkovitch and Narayanan (1993) presented in Table 2.7 of Chapter 2. Berkovitch and Narayanan posited that there might be a simultaneous existence of more than one motives behind M&A. The combined gain figure would not be able to reveal this. Hence this research will look into the correlation between target gain and total gain and the correlation between target gain and acquirer gain to determine the presence of two or more motives behind M&A of European utilities. Detailed discussion of the two methodologies pertaining to the examination of motives behind M&A will be undertaken in Section 4.2.4 of Chapter 4.

Next I will discuss the different testable hypotheses of synergy, agency or hubris or a combination of them which are postulated by different empirical studies.

#### *Presence of synergy motive*

The synergy hypothesis proposes that M&A take place when the value of the combined firm is greater than the sum of the values of the individual firms. Thus under synergy motive the average total gain of a sample of European utility firms that are engaged in M&A will be positive. Moreover under synergy motive there would be a *positive correlation* between target gain and total gain. Berkovitch and Narayanan (1993) argued that the positive correlation would generate from the bargaining power of the target firms. This bargaining power could either stem from resistance of the target or from competition among potential acquirers for the target. Berkovitch and Narayanan argued that under the presence of such bargaining power the target gain will increase with total gain leading to a positive correlation. Therefore in this thesis if

the results indicate that either the total gain is positive or there is also a positive correlation between target gain and total gain then presence of synergy motive behind M&A of European utility sectors can be concluded.

### *Presence of agency motive*

The definition of agency motive suggests that managers of the acquiring firms engage in M&A in order to maximise their own self interest at the expense of the shareholders. Thus if there is the presence of agency motive then mean total gain of the sample of European utilities that embarked in M&A will be negative. Moreover the target shareholders realising their value to the acquirer management will tend to extract a higher premium from the acquirer managers. Thus the target gain might be positive even when the total gain is negative. Here the losses to the acquirers are more than offset by the gains to the target firms leading to negative total gains. The more severe the agency problem the higher will be the target gain. Since the total gain is negative therefore under agency motive there will be a *negative correlation* between target gain and total gain. From this discussion it is evident that in the context of M&A of European utility sectors if the findings of this thesis suggest that either the combined gain is negative or there is a negative correlation between target gain and total gain then presence of agency motive can be deduced.

### *Presence of hubris*

Hubris theory contend that there are no gains from M&A and takeovers take place due to acquirer managers' overconfidence/mistakes in estimating the potential gains from



M&A. Hence if there is hubris behind M&A of European utilities then mean total gain will be zero. But even under the presence of hubris the target shareholders would extract some premium from the acquirer shareholders. Due to this reason under hubris motive there is a transfer of wealth from acquirer to target shareholders. Since the total gain is zero hence under hubris there would be *no correlation* between target gain and total gain. Hence presence of hubris can be identified if the findings either indicate that there is zero total gain from M&A or there is zero correlation between target gain and total gain.

So far the discussion on the motives behind M&A have been designed to examine the presence of synergy, agency or hubris motives by testing the correlation between target gain and total gain. In order to determine the simultaneous presence of two motives behind M&A it is imperative to examine the subsample of positive and negative total gains. For this the sample of European utilities that engaged in M&A would have to be partitioned into a subsample of positive total gain and a subsample of negative total gain.

#### *Presence of synergy and agency motive*

As discussed above takeovers with positive mean total gain imply synergy and takeovers with negative mean total gain imply agency. Therefore under synergy motive there will be positive correlation between target gain and total gain in both the sub-samples of positive total gain and negative total gain. Similarly under agency motive there would be negative correlation between target gain and total gain in both the sub-sample of positive total gain and subsample of negative total gain. Hence if there is a positive correlation between target gain and total gain in the positive total



gains subsample and negative correlation between target gain and total gain in the negative total gains subsample then it would imply simultaneous presence of both synergy and agency motives behind M&A. In this thesis I intend to examine whether there is simultaneous presence of synergy and agency motives in the context of M&A of European utility sectors. To further this objective the sample of total gains will be partitioned into subsamples of positive and negative total gains. Further discussion of this methodology is given in Section 4.2.4 of Chapter 4.

#### ***Presence of agency and hubris motive***

By definition, if we observe agency motive the mean total gain of a sample of M&A will be negative. To determine the presence of agency and hubris motive behind M&A in the sample of European utilities it is necessary to analyse the correlation between target gain and total gain in the subsample of negative total gain. This is because since agency motive implies negative total gain so it is evident that there will be no presence of agency motive in the sub-sample of positive total gain. In this study if the result indicates that in the subsample of negative total gain the correlation between target gain and total gain is zero then simultaneous presence of both agency and hubris motives behind M&A can be concluded.

#### ***Presence of both synergy and hubris motive***

To determine the presence of synergy and hubris motive behind M&A in the sample of European utilities it is necessary to analyse the correlation between target gain and acquirer gain in the subsample of positive total gain. This is because since synergy

implies positive total gain so it is evident that there will be no presence of synergy motive in the sub-sample of negative total gain.

In the positive total gain subsample it is possible that there is a subgroup of acquirers whose gains are negative<sup>39</sup>. In the positive total gain subsample if there is positive correlation between target gain and acquirer gain for the subgroup of acquirers with positive gains (evidence of synergy) and negative correlation between target gain and acquirer gain for the sub-group of acquirers with negative gains (evidence of hubris) then this would imply the coexistence of synergy and hubris motive. Since hubris motive imply that there is zero total gain therefore under hubris motive there is a transfer of wealth from acquirer to target shareholders. Thus under hubris motive the amount of positive gain accrued to the target shareholders is exactly the amount of negative gain or loss that is borne by the acquirer shareholders. So in the presence of hubris motive there will be negative correlation between target and acquirer gain for the subgroup of acquirers with negative gain. Therefore given this argument in this study I set to examine the correlation between target gain and acquirer gain in the positive total gain subsample to determine the simultaneous presence of synergy motive and hubris behind M&A of European utility sectors.

The findings on the motives behind M&A of European utility sectors will have important policy implications from regulatory perspective. Specifically if the results of this thesis suggest that M&A of European utility sectors are caused by agency motive or managerial hubris then it would signal the regulatory bodies to be more vigilant in future and prevent such undesirable M&A from taking place.

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<sup>39</sup> Since total gain is a sum of target gain and acquirer gain therefore in the subgroup of acquirer whose gains are negative, positive total gain emanates from positive target gain. In this case the negative gains of the acquirers are outweighed by the positive gains of the target resulting in a positive total gain.



### 3.3 Summary

In this Chapter I have firstly presented a critique of the extant literature that were reviewed in Chapter 2 and have highlighted the key issues and gaps in these studies. Firstly from the review of literature it is evident that there is a lack of evidence on how the M&A of European utilities had an impact on the shareholders' wealth both in the short run and in the long run. Secondly none of these studies have examined the motives behind M&A of European utilities from finance theory perspective. Specifically finance literature has documented three predominant theories behind M&A which are synergy, agency and hubris. But there is no empirical literature that has examined the M&A of the European utilities on the basis of these three motives.

Overall the review of studies document that there is a good number of empirical studies that have examined the market for corporate control in finance literature. However none of these studies have examined this in the context of M&A of European utility sectors. Since the utility sectors are regulated and they have important social welfare characteristics hence impact of M&A in these sectors requires serious consideration. In this context the objectives of this thesis is to examine (a) how the M&A of European utility sectors had an impact on the shareholders wealth (b) the source of shareholders' gains or losses from these M&A and (c) the motives behind these M&A.

Based on these objectives Section 3.2 presented the three research questions that this thesis will address. In this Section I have also outlined the proposed methodology and their respective hypotheses.



The methodology that will be used to address the three research questions has been discussed in Chapter 4 and the results have been discussed in Chapters 5 and 6.

## **Chapter 4**

### **Methodology and Data collection**

#### **4.0 Introduction**

In Chapter 3 I have presented the three research questions that this thesis aims to address. Broadly the purpose of this thesis is to examine the M&A of European utility sectors from the perspective of finance theory. Specifically this research proposes to examine three different areas pertaining to M&A of European utility sectors. Firstly I examine how the M&A of European utility sectors have affected the shareholders' wealth. Secondly I intend to study the determinants or the sources of changes to shareholders' wealth. Thirdly I look into the motives behind M&A in utility sectors.

Given these research objectives the purpose of this Chapter is to discuss the different methodologies that have been implemented to answer these questions. However before moving into the detailed discussion of the methodologies this Chapter first presents the philosophical perspective of this research and provides a broad justification behind the chosen research design. This is presented in Section 4.1. Section 4.2 presents the various methodologies to address the three research question and also discusses the underlying principles behind these chosen methodologies. Specifically Subsection 4.2.1 discusses the measurement of short run stock price performance using different benchmark models. Subsection 4.2.2 examines the methodologies for the measurement of long run stock price performance. Subsection 4.2.3 presents the discussion of methodology to address the second research question

on the determinants of shareholder returns. Subsection 4.2.4 exhibits the two approaches to determine the motives behind M&A of European utilities. Section 4.3 discusses the source of data collection and sample selection process. Section 4.4 concludes.

#### **4.1 The philosophical perspective: justification behind the chosen methodology**

The purpose of this Section is firstly to discuss the different philosophical traditions of research design. Secondly I establish where my research is positioned within these different philosophical traditions. In doing so I shall present the justification for my chosen research design.

Broadly there are two philosophical traditions in social science research (a) positivism and (b) social constructionism (Easterby-Smith et al, 2002). Positivism by definition suggests that social world exists externally and its properties should be measured externally through objective methods rather than subjectively through sensation, intuition or reflection (Easterby-Smith et al, 2002). Social constructionism on the other hand suggests that reality is determined by people rather than by objective or external factors.

Given these two philosophical traditions Crotty (1998) outlined that a research process involves four elements. This is shown in Table 4.1 below.



**Table 4.1 Philosophy of research process**

<b>Epistemology:</b> way of understanding and explaining 'how we know what we know'	<b>Theoretical perspective:</b> philosophical stance that lies behind the chosen methodology	<b>Methodology:</b> strategy, plan of action that lies behind the choice and use of particular methods	<b>Methods:</b> technique or procedure used to gather or analyse data related to some research question or hypothesis
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Positivism and social constructionism are the two broad epistemologies under which different social science researches are situated (Crotty, 1998). Crotty (op. cit.) also showed that there are several theoretical perspectives that can be categorised under the broad philosophy of positivism and social constructionism. Similarly there are several methodologies and methods that fall under the different theoretical perspectives.

As discussed in the previous Chapters the objective of this thesis is to examine the M&A of European utility sectors from finance theory perspective. In the words of Franfurter and McGoun (2000), *“The methodology of financial economics in general and research in market efficiency in particular, is unmistakably the methodology of positive economics as invented by Friedman (1953)...”*. The theory of positive economics in its turn as postulated in the book *“The Methodology of Positive Economics”* by Friedman (1953, p.5 cited in [www.wikipedia.org](http://www.wikipedia.org), May 2010) states that *“...economics as science should be free of normative judgments for it to be respected as objective and to inform normative economics. Normative judgments frequently involve implicit predictions about the consequences of different policies.”* From this discussion it is apparent that research in finance entails a positivist epistemology. Given this argument of positivist epistemology underlying the research

in financial economics tradition, the dominant trend in financial economics research has been to adopt this positivist research paradigm. In fact the existing finance literature on M&A that I have reviewed in Chapter 2 has examined the value changes realised through M&A by adopting a positivist/objectivist approach entailing numerical data analysis.

As outlined in the previous Chapters in this study the first research question I aim to examine is the change in shareholder wealth in the context of M&A of European utility sectors. Both the short run announcement period as well as long run post acquisition period changes in shareholder wealth following M&A will be examined. The short run announcement period change in shareholder wealth creation is based on the theory of efficient markets which I have discussed in Chapter 2. In order to examine the realised returns following M&A I intend to examine the long run post acquisition performance. So the first research question will be addressed following a quantitative approach which falls under the spectrum of positivist research.

The second research question that I have presented in Chapter 3 is to examine the determinants of the shareholder wealth creation with the types of M&A. To address this question I have used two multiple regression analyses. The aim of this multiple regression is to establish causality. Specifically I shall examine whether the change in shareholder wealth creation following M&A can be explained by different characteristics of M&A.

The third research question is to analyse the motives behind M&A of European utility sectors. Three distinct theories have been postulated in finance literature on the



motives behind M&A which are synergy, agency and hubris. To examine these motives existing finance literature has employed two different methods. These methods are the combined gains methods and the regression approach. Hence following this existing finance literature in this thesis I have applied these methods to examine the motives behind M&A in the context of European utility sectors. In Section 4.2.4 I have discussed these methods in detail.

Therefore taken together the research questions I intend to address in this thesis are positioned under the positivist research tradition. Specifically I adopt a quantitative approach following existing finance literature on M&A to examine the three research questions on M&A of European utility sectors. The philosophical perspective behind the chosen methodologies is presented in Table 4.2 below.

**Table 4.2 Research design**

Epistemology	Theoretical perspective	Methodology	Methods
Positivism: social world exists externally and so its properties should be measured through objective methods rather than subjectively through sensation, reflection or intuition	Finance theory perspective	Event study methodology and regression analysis	Numerical data analysis

### 4.2 Methodology

The event study methodology has been used to address the change in shareholder wealth both in the short run after the announcement of the event and in the long run



post merger period. Event study methodology was first introduced by Fama et al (1969). This method examines changes in security prices in response to an event or announcement. Event studies help to examine how the flow of information to the market about an event affects stock prices (Sudarsanam, 2003). It is therefore a powerful tool for assessing the impact of corporate changes on the value of a firm. Event studies are used for two purposes (Sudarsanam, 2003). First it is used to test market efficiency and second it is used to examine the wealth impact of an event.

In Section 2.3.1 I have discussed that short run event studies are based on the efficient market hypothesis (EMH). The semi strong version of EMH posits that in an efficient market security prices reflect all publicly available information (Fama, 1970). Thus following the EMH this study posits that the impact of announcements of M&A on shareholders' wealth will be captured by security returns following these M&A announcements. In this study the short run security price performance of the European utilities following M&A has been analysed using three benchmark models. The methodology on the short run event study has been discussed in Section 4.2.1.

The long run event study (typically 3 to 5 years) test the security returns following the merger completion (Agrawal et al, 1992; Loughran and Vijh, 1997; Andrade et al, 2001). As discussed in Section 3.2 two long run abnormal performance estimators have been used in this research to ensure the robustness of the results across different model specification. The three year post merger performance has been examined by analysing the Buy and Hold abnormal returns (*BHAR*) and the Calendar Time abnormal returns (*CTAR*). This has been shown in Section 4.2.2.

For both the short run and long run event study methods I have taken equally weighted market index. This is because under value weighted index the null hypothesis of zero abnormal returns gets rejected very often (Brown and Warner, 1980, p.148). Brown and Warner (1980) also reported in their simulation study that there is no evidence that value weighted index will improve the power of the tests. Moreover Higson and Elliott (1998) reported that value weighted index might be driven by few large takeovers.

To address the second research question on the determinants of short run and long run shareholders' returns I have conducted multiple regression analyses. I have discussed this in Section 4.2.3. To address the third research question on the motives underlying the M&A of European utilities first the combined gains of the target and acquirer shareholders have been analysed around the M&A announcement date. The second method that has been used to analyse the motives is by examining the correlation between target gains and acquirer gains and between the target gains and total gains. This has been discussed in details in Section 4.2.4.

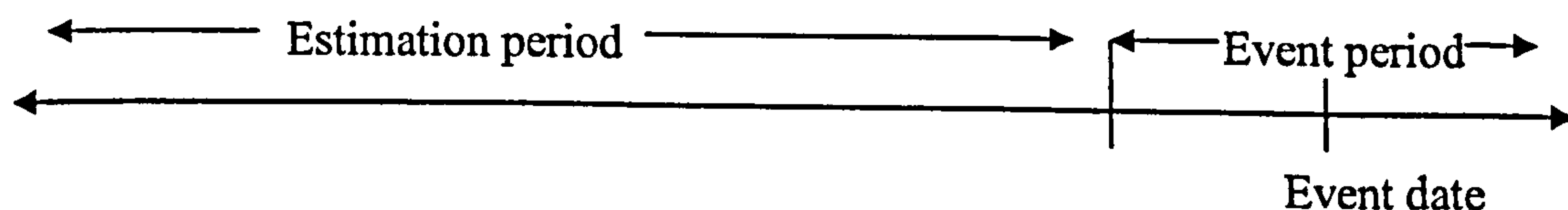
#### **4.2.1 Measurement of short run stock price performance**

The short run stock price performance following the announcement of the event has been examined using daily stock price data. Under the short run event study methodology the wealth effect of a security following the announcement of M&A is obtained by calculating the abnormal returns of the securities surrounding the announcement date. As discussed in Section 2.4.1 of Chapter 2 the short run event study is based on the efficient market hypothesis (EMH). The efficient market



hypothesis posits that in the absence of any event announcement the securities are expected to earn normal returns. So presence of abnormal movements in share prices following the announcement of an event reflects the impact of the announcement of the event on the security returns. This is the reason why event study measure abnormal returns following the announcement of an event. This is in fact the essence of event study methodology. Brown and Warner (1980) posit that a security price performance can be shown as 'abnormal' when it is compared to a benchmark (normal returns). The abnormal return is the difference between actual ex-post return of the security which is obtained over the event window and the normal or expected return of the firm that is obtained from the estimation window. The event window is the number of days where the abnormal return is calculated surrounding the event date. The event window in earlier empirical studies reviewed in Table 2.2 of Chapter 2 normally extends from 11 days to 21 days surrounding the event date. This thesis has examined the abnormal returns on an 11 days (-5 to +5) event window surrounding the event date. Following Brown and Warner (1985) in this study the estimation window extends from -6 days to -244 days prior to the event date. The event window and the estimation window should not coincide in order to prevent the event announcement from influencing the normal performance model parameter estimates. This is shown in Figure 4.1 below.

**Figure 4.1 Illustration of event period and estimation period**



The normal or expected returns are determined ex-ante over the estimation window on the basis of different return generating models or benchmark models. Different benchmarks models make different assumptions about the expected (normal) returns



of the securities (Brown and Warner, 1980, 1985). This study has used three benchmark models to determine the expected (normal) returns of the securities using daily share price data. These models are ordinary least squares (OLS) market model, the world market model and the mean adjusted returns model. The different assumptions of expected return under each of these three benchmark models will be discussed in the following Subsections.

The reason for using OLS market model<sup>40</sup> is that it is ‘relatively powerful’ and ‘well specified’ under a variety of conditions (Brown and Warner, 1985). In addition in this study I have applied the world market model benchmark due to the following reason. Park (2004) argued that event study in a multi country setting should incorporate world market model as benchmark in order to capture the movements in global market index and changes in exchange rate. Since in this study the utility companies that were subject to M&A are from different European countries therefore following Park (2004) in this thesis I have applied the world market model. Finally in order to determine the robustness of the results obtained from these two benchmark models, I have used the mean adjusted model to determine the abnormal returns.

#### ***4.2.1.1 OLS market model***

The OLS market model benchmark assumes that return of security  $i$  at time  $t$  is a function of market return at time  $t$ . This is expressed as follows:

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<sup>40</sup> Brown and Warner (1985) used a simulation approach to examine the impact of events on security returns. Using randomly selected securities and assigning random event date to each security they analysed how the returns reacted around the event period. Their study showed that OLS market model are well specified under a variety of conditions.

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (4.1)$$

Where  $R_{i,t}$  is the rate of return for security  $i$  on day  $t$ ;  $R_{m,t}$  is the rate of return on the equally weighted market portfolio on day  $t$ . In this study the sample of firms comes from different European countries and each country has different market indices. Therefore for each firm their respective countries' market index has been used to calculate the market return  $R_{m,t}$ .  $\alpha_i$  and  $\beta_i$  are the intercept and slope parameter for security  $i$  respectively; and  $\varepsilon_{i,t}$  is the error term for security  $i$  on day  $t$ . The parameters  $\alpha_i$  and  $\beta_i$  are estimated by regressing security returns  $R_{i,t}$  on the market return  $R_{m,t}$  for the estimation period. The estimates of  $\alpha_i$  and  $\beta_i$  are denoted by  $\hat{\alpha}$  and  $\hat{\beta}$  respectively.  $\hat{\alpha}$  and  $\hat{\beta}$  are thereby used to obtain the expected return. Thus the expected return  $E(R_{i,t})$  of security  $i$  at time  $t$  under the market model is given by

$$E(R_{i,t}) = \hat{\alpha} + \hat{\beta} R_{m,t} \quad (4.2)$$

Hence as shown in Equation 4.2 under the OLS market model the expected return of a security is obtained by estimating the securities sensitivity to the general market movements prior to the event date. Denoting the event date as day 0, the estimation period has been taken from day -244 to day -6. The event period in this study has been taken from -5 days to +5 days surrounding the event announcement date. As discussed above the event period and the estimation period should not coincide so that the effect of event announcement is not reflected in the share price returns on the estimation period. So the estimation period is cut off at 6 days before the announcement to search for possible leakages of information prior to the announcement (Bertunek et al, 1993).



#### **4.2.1.2 World market model**

The utility companies that have been analysed in this study are from different European countries. Thus for each security in the sample their respective local market index was used to estimate the abnormal returns in the OLS market model (given by Equation 4.1). In addition in the world market model Park (2004) incorporated the impacts of local market index, world market index and foreign exchange rate. Park reviewed several studies which reported that returns of a security are not only affected by movements in local market index but also by change in global market index. The reason for the influence of global market index on a security price return of a particular country is the integration of global capital market (Conn and Connell, 1990; Becker et al, 1996 and Chaumenton et al, 1998 as cited in Park, 2004). So in the world market model Park (2004) has incorporated the global market index to estimate the returns of an individual security. This is shown in Equation 4.3 below. Park (2004) also documents another factor that explains the stock price return. This is the foreign currency exchange rate. There are several empirical studies cited by Park (2004) which reported that stock returns of individual firms are significantly affected by movements in exchange rate. The economic logic behind this argument is that equity markets in most countries continuously readjust stock prices in response to simultaneous or lagged movements of foreign exchange. Hence to incorporate the impact of change in foreign exchange rate on the returns of security prices Park (2004) proposed to use the third independent variable to estimate the security price's return. This variable is the change in foreign currency exchange rate in the domestic country. Park showed that this world market model has more power in explaining



short run abnormal returns to events across different countries. The world market model is expressed as follows:

$$R_{i,t} = \alpha_i + \beta_{1,i}R_{Lmt} + \beta_{2,i}R_{Wmt} + \beta_{3,i}ER_{j,t} + \varepsilon_{i,t} \quad (4.3)$$

Here the parameters  $\alpha_i$ ,  $\beta_{1,i}$ ,  $\beta_{2,i}$  and  $\beta_{3,i}$  are estimated over the estimation period (-6 to -244 days prior to the event date) by regressing security return  $R_{i,t}$  on the return of local market index  $R_{Lmt}$ , return on world market index  $R_{Wmt}$  and  $ER_{j,t}$  is the change in foreign currency exchange rate in country  $j$  at time  $t$ . This study has used FTSE-All world index returns as the return on world market index  $R_{Wmt}$  and the relative change of local currency in terms of US dollars as  $ER_{j,t}$ . Under the world market model the expected return  $E(R_{i,t})$  is given by:

$$E(R_{i,t}) = \hat{\alpha} + \hat{\beta}_{1,i}R_{Lmt} + \hat{\beta}_{2,i}R_{Wmt} + \hat{\beta}_{3,i}ER_{j,t} \quad (4.4)$$

#### 4.2.1.3 Mean adjusted model

The mean adjusted benchmark model assumes that the ex ante expected return for a security is constant across time but can differ among securities. In this model the expected return  $E(R_{i,t})$  for security  $i$  at time  $t$  is the average return of the security over the estimation period which ranged from -244 days to -6 days of the event date.

This is shown as follows

$$E(R_{i,t}) = \frac{1}{239} \sum_{t=-244}^{-6} R_{i,t} \quad (4.5)$$

This model is consistent with capital asset pricing model (CAPM) under the assumption of constant systematic risk ( $\beta=1$ ) for all securities and stationery optimal investment opportunity for investors (Sudarsanam 2003, p. 91). Both the OLS market

model and the mean adjusted model determine the expected return over the estimation period which ranges from -244 days to -6 days prior to the event date. However in the OLS market model the expected return is obtained by regressing the actual return of security  $i$  on market return over the estimation period while under the mean adjusted model the expected return of a security is the average return of that security over the estimation period.

#### **4.2.1.4 Abnormal Returns**

As defined in Section 4.2.1 above the abnormal return for each event  $AR_{i,t}$  is the difference between the actual return  $R_{i,t}$  and expected return  $E(R_{i,t})$

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (4.6)$$

The M&A of European utilities' data that has been gathered from SDC showed that some of the securities in the sample of both the acquirer and the target have identical event dates. Moreover in 50 percent cases in my sample of European utilities even if the event dates did not match the event window coincided for some securities in the sample. This phenomenon is termed as clustering in event study literature (Brown and Warner, 1980; Campbell et al, 1997; Collins and Dent, 1984). Under clustering when event windows overlap between two or more securities the co-variances between the abnormal returns may differ from zero and the distributed results presented for the aggregated abnormal returns are not applicable (Campbell et al, 1997). As a result of clustering of event windows the abnormal returns of individual securities may suffer from contemporaneous correlation problem (Collins and Dent, 1984; Brown and Warner, 1985; Mackinlay 1997). Contemporaneous correlation problem refers to the cross sectional dependence of the security specific abnormal returns. Collins and Dent

(1984) reported the degree to which the standard deviation of cross sectional sample mean is underestimated when correlation between return data is ignored.

One approach that is applied under clustering of event date is the portfolio approach of Jaffe (1974). The portfolio approach is designed to take into account the correlation between abnormal returns of different securities. Under this approach portfolios were formed taking those securities whose event periods coincided. Therefore following Collins and Dent (1984) the portfolio abnormal returns are calculated as follows

$$AR_{p,t} = \frac{1}{n} \sum_{i=1}^n AR_{i,t} \quad (4.7)$$

where  $n$  is the number of securities whose event period coincided on day  $t$ . Only  $AR_{i,t}$  of the securities were included for those securities whose event period did not coincide.

The average abnormal returns ( $AAR$ ) have been calculated across the  $N$  portfolios for the 11 days surrounding the event. The  $AAR$  are calculated as follows

$$AAR_t = \frac{\sum_{p=1}^{N_1} AR_{p,t} + \sum_{i=1}^{N_2} AR_{i,t}}{N}, \quad N = N_1 + N_2; \quad t = T(-5), T(-4), \dots, T(0), T(4), T(5) \quad (4.8)$$

where  $T(-5)$  is 5 days prior to the event date and  $T(5)$  is 5 days after the event date. Here  $N$  is the sum of number of portfolios (for those securities whose event date coincided) and individual securities (for those securities whose event date did not coincide) that has been formed across various event dates.

The short run wealth effects for the bidding and the target firms are measured by calculating the cumulative average abnormal returns (CAAR) surrounding the



announcement date. The CAAR help to determine the overall inference of the event (Mackinlay, 1997). Moreover CAAR also helps to show the impact of the event over a multiple event window (Brown and Warner, 1980; Mackinlay, 1997).

The CAARs are aggregated using different event windows.

$$\text{Therefore } CAAR_{t1,t2} = \sum_{t1}^{t2} AAR_t, \quad (4.9)$$

$CAAR_{t1,t2}$  is the cumulative average abnormal returns from event window  $t1$  to  $t2$

where  $T(-5) \leq t1 < t2 \leq T(5)$ .

The null hypothesis  $H_0$  posits that there are no significant CAARs around the event announcement date for both the target and acquirer shareholders of the European utilities engaged in M&A. So  $CAAR(t_1, t_2)$  follows a normal distribution with mean 0 and constant variance denoted by  $\sigma^2(t_1, t_2)$ . This is shown as follows

$$CAAR(t_1, t_2) \sim N(0, \sigma^2(t_1, t_2)) \quad (4.10)$$

#### 4.2.1.5 Test Statistic

Following Collins and Dent (1984) and Brown and Warner (1985) this study has used the time series standard deviation test as the test statistic to examine the statistical significance of  $AAR_t$  and  $CAAR_{t1,t2}$ . This test uses a single variance estimate for the entire portfolio. The estimated variance of  $AAR_t$  is calculated over the estimation period of 239 days starting from -6day to -244 day. This is given by

$$\hat{\sigma}_{AAR}^2 = \frac{\sum_{t=E1}^{E2} (AAR_t - \overline{AAR})^2}{238}, \quad (4.11)$$

Where:

$$\overline{AAR} = \frac{1}{239} \sum_{t=-6}^{-244} AAR_t$$

The portfolio test statistic for the event date  $t$  is given by

$$t = \frac{AAR_t}{\hat{\sigma}_{AAR}} \quad (4.12)$$

The test statistic for  $CAAR_{t1,t2}$  is given by

$$t_{CAAR} = \frac{CAAR_{t1,t2}}{(t2 - t1 + 1)^{\frac{1}{2}} \hat{\sigma}_{AAR}} \quad (4.13)$$

Equations 4.12 and 4.13 test the null hypothesis that the mean abnormal performance is zero in the short run following the announcement of M&A. After running the regression of OLS market model and world market model for the sample of both the targets and acquirers it was found that Durbin Watson test statistic showed either presence of positive or negative autocorrelation in a small percentage of target and acquirer securities. Brown and Warner (1985) document that failure to take into account this autocorrelation could lead to misspecification of the test statistic. Thus to correct the autocorrelation generalised least square has been applied to the OLS market model and the world market model (Gujarati, 2003). This is given in Appendix A4.1 and A4.2.

#### 4.2.2 Measurement of long run stock price performance

M&A literature in finance generally use two approaches to study the post acquisition performance. These are a stock-based approach and an accounting based approach. The accounting based approach is not commonly used since accounting data contains

much noise and is subject to earnings announcement (Healy et al, 1997). Hence this thesis has employed the stock based approach to measure the post acquisition performance. The three main ways of calculating the long term stock returns are the buy and hold abnormal returns (*BHAR*), cumulative abnormal returns (*CAR*) and Calendar time abnormal returns (*CTAR*).

The *BHAR* approach is favoured by some researchers because *BHARs* are more consistent with the true investor experience than the *CARs* to determine the long run post merger monthly abnormal returns of the securities that engaged in M&A (Barber and Lyon, 1997; Lyon et al., 1999). As Barber and Lyon (1997) had put forward the differences between *CARs* and *BHARs* emanate from the result of monthly compounding. While *CARs* ignore compounding the *BHARs* include the effect of compounding. So an annual *BHAR* determines the yearly abnormal return a 12 month *CAR* does not readily translate into a measure of annual performance. This is because dividing the 12 month *CAR* by 12 yields the mean monthly abnormal returns (Barber and Lyon, 1997). In fact Barber and Lyon (1997) showed that *CARs* are biased predictors of *BHARs*. They showed that a sample of firm that have zero annual *BHAR* had a mean annual *CAR* of 5%. Therefore if researchers use annual *CARs* instead of *BHARs* they would wrongly conclude presence of abnormal returns when there is none. They refer this problem as measurement bias. Due to these problems with long run *CAR* this research has used the *BHAR* approach to determine the long run abnormal returns in the sample of European utilities engaged in M&A.

However the *BHAR* approach does not take into account the cross-sectional dependence among sample firms. This problem has been taken into account in the



*CTAR* approach. Hence in this thesis I have also incorporated the *CTAR* in order to test the robustness of the result obtained under the *BHAR* approach.

In the *CTAR* approach the average abnormal return is obtained for each calendar month for all event firms within the prior pre-specified investment periods (such as 1 year, 2 years and 3 years). Since the event portfolios are formed each month so the cross-sectional correlations of the individual event firm returns are automatically accounted for in the portfolio variance at each point in calendar time. Thus the cross sectional dependence which might prevail under *BHAR* approach is taken into account in this method.

Since the *CTAR* method takes into account the cross-sectional dependence of securities therefore this approach is an improvement over the *BHAR* approach. However Lyon et al (1999) document that *BHAR* captures the true investor experience but the *CTAR* does not precisely measure the investor experience. This is because *CTAR* takes into account the average abnormal returns of each calendar month for all event firms within the prior pre-specified investment periods (such as one year, two years and three years). Since both the approaches have certain pros and cons, the long run post merger abnormal returns have been analysed in this thesis using both *BHAR* and *CTAR* method in order to ensure robustness of the long run result across different model specifications. Lyon et al (1999) also recommended that in a particular study of long run abnormal returns both the *BHAR* and *CTAR* method should be used in order to ensure robustness of the results.

The long run post merger event window in both the *BHAR* and the *CTAR* approach is taken as three years after the acquisition completion month which is referred as month 0. Majority of long run event studies such as Barber and Lyon (1997), Rau and Vermaelen (1998), Sudarsanam and Mahate (2003) and Conn et al (2005) have adopted a 3-year event window. The rationale behind using a three year window is that acquisitions have a strong and extended impact on firm profile and this can be reflected in multi-year firm performance.

Under both these approaches the three year post merger abnormal returns have been analysed by examining the monthly stock returns. Monthly return data is argued to be more appropriate than daily return data in long term event studies. This is because monthly data reduces many of the problems encountered using daily return data such as overstatement of the magnitude of abnormal returns because returns are compounded daily (Roll, 1983; Kennedy and Limmack, 1996). Similar to the measurement of short run abnormal returns, the long run *BHARs* and *CTARs* are analysed using some benchmark (normal) returns. The benchmark or normal returns are the returns which the firms are expected to earn in the absence of any event.

#### ***4.2.2.1 Buy and Hold abnormal return***

The buy-and-hold abnormal return, or *BHAR*, approach measures the average multi-year return from a strategy of buying all firms involved with an event and selling at the end of a pre-specified holding period versus a comparable strategy investing otherwise similar non-event firms (Mitchell and Stafford, 2000). The *BHAR* of security *i* for the holding period *T* is calculated as follow.

$$BHAR_{i,T} = \prod_{t=1}^T [1 + R_{i,t}] - \prod_{t=1}^T [1 + E(R_{i,t})] \quad (4.14)$$

In Equation 4.14  $R_{i,t}$  is the return of security  $i$  at month  $t$  and  $E(R_{i,t})$  is the expected or normal monthly return based on a benchmark model.  $T$  is the number of months in the holding period that has been analysed following the event completion month. In this study 1 year, 2 years and 3 years holding period  $BHAR$ s are analysed following the event completion month.

The average  $BHAR$  ( $ABHAR$ ) for the sample of  $N$  firms for a particular holding period  $T$  (1, 2, or 3 years post merger) is calculated as follows

$$ABHAR_T = \frac{1}{N} \sum_{i=1}^N BHAR_{i,T} \quad (4.15)$$

#### 4.2.2.2 Benchmark model used to calculate $BHAR$

Fama and French (1992) showed that common stock returns are related to firm size and book value to market value ratio. So they suggested that any test for detecting long run abnormal returns should control for firm size and book to market ratio. In the  $BHAR$  approach I have taken a reference portfolio (also referred as control portfolio) based on size (market capitalisation) and market value to book value<sup>41</sup> (MV/BV) ratio as benchmarks. The expected return  $E(R_{i,t})$  for each security in the sample is the average return of the securities in the control portfolio that has been sorted from the list of firms in each sample security's respective market index. In this study the

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<sup>41</sup> As outlined in Footnote 36 of Chapter 2 (p.67) some studies have used book to market value as benchmarks (Fama and French, 1992, 1993) while some studies have used market to book value as benchmarks (Rau and Vermaelen, 1998 and Sudarsanam and Mahate, 2003).



control portfolios are determined from the list of the firms in the market index that matches closely to the sample firms in terms of size (market capitalisation) and MV/BV. To determine the size and MV/BV matching control portfolios first all the stocks listed in each sample country's market index have been collected. For each firm in the sample their respective country's stocks in the market index are ranked on the basis of their market capitalisation at the end of June for each sample year. Fama and French (1993) have selected June of each year so as to ensure that the book value of each stock becomes available. Following Fama and French (1993) this study has used June<sup>42</sup> of year  $t$  to rank the stocks in the market index in terms of size and book to market ratio. These portfolios are again rebalanced in June of year  $t+1$  to drop those stocks which have delisted and include those that have been newly listed. These stocks are then grouped into 5 portfolios. Stocks with the smallest market values are placed in portfolio 1 and stocks with largest market values are placed in portfolio 5. Each size (market values) quintiles is further divided into five subgroups based on their MV/BV ratio. Stocks with the smallest MV/BV ratios are placed into sub-group 1, and those with the largest MV/BV ratios are placed into sub-group 5. This led to the construction of 25 size and MV/BV control portfolios. The control portfolios are constructed at June of each year and the returns are calculated from July of each year. Out of these 25 size and MV/BV control portfolios, the portfolio whose size and MV/BV matches closely to a sample firm's size and MV/BV on the M&A completion month is selected. The equally weighted average return of the control portfolio is the expected return for the respective sample firm<sup>43</sup>.

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<sup>42</sup> Most of the extant studies that have used the reference portfolio approach have used June to construct the portfolio.

<sup>43</sup> If the event completion month for a sample firm falls between January and June of year  $t$  then the control portfolio for each year has been determined by rebalancing the portfolios at June of year  $t-1$ ,  $t$  and  $t+1$  (since 3 year BHARs has been analysed). If the event month falls between July to December of

#### 4.2.2.3 Test Statistic for BHAR

To test the null hypothesis that the mean abnormal performance is equal to zero for the sample of N European utilities the following test statistic has been employed

$$t_{BHAR} = \frac{ABHAR_T}{\sigma(BHAR_{i,T})/\sqrt{N}} \quad (4.16)$$

In Equation 4.16,  $\sigma(BHAR_{i,T})$  is the cross sectional sample standard deviation of the individual *BHAR* for the sample of N firms.

#### 4.2.2.4 Calendar time abnormal returns

The second approach that has been applied in this study to determine long run abnormal returns is the calendar time abnormal returns approach. This approach is strongly advocated by Fama (1998) and Mitchell and Stafford (2000). This approach is specified as follows

$$CTAR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (4.17)$$

$R_{i,t}$  is the return of security *i* at month *t* and  $E(R_{i,t})$  is the expected or normal monthly return based on a benchmark model.

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year *t* then the control portfolio for each year has been determined by rebalancing the portfolios at June of year *t* and *t*+1, and *t*+2.

In each calendar month  $t$ , a portfolio from the sample firms is formed by including all stocks from the sample firms which have completed M&A in the past 12, 24 or 36 months. The average  $CTAR$  for the portfolio of firms in a calendar month  $t$  is denoted by  $\overline{CTAR}_t$ . This is shown in Equation 4.18.

In the next calendar month  $t+1$  the portfolio is rebalanced to include new event firms that executed an M&A in the previous month and disregard those that have completed one-to-three years of their M&A. For each security in the sample their market capitalisation data and MV/BV ratio is collected on their respective event completion month.

For each calendar month  $t$  a mean  $\overline{CTAR}_t$  is calculated across the firms.

$$\overline{CTAR}_t = \sum_{i=1}^{N_t} \frac{1}{N_t} CTAR_{i,t} \quad (4.18)$$

$N_t$  is the number of sample firms in the calendar month  $t$ . The monthly  $\overline{CTAR}_t$  are standardized by estimates of portfolio standard deviation following Mitchell and Stafford (2000). The standardized  $\overline{CTAR}_t$  helps to control for heteroskedasticity.

$$S\overline{CTAR}_t = \frac{\overline{CTAR}_t}{\sigma_{\overline{CTAR}_t}} \quad (4.19)$$

$\sigma_{\overline{CTAR}_t}$  for a calendar month  $t$  is the standard deviation of the  $CTAR$ s for the portfolio of firms in a particular calendar month  $t$ . The total number of calendar months is denoted by  $T$ . Therefore there are  $T$  numbers of  $\sigma_{\overline{CTAR}_t}$  each for a particular calendar month. A grand mean of the monthly standardized  $\overline{CTAR}_t$  is thereby calculated as follows:



$$MSCTAR = \frac{1}{T} \sum_{i=1}^T \overline{SCTAR_i} \quad (4.20)$$

#### 4.2.2.5 Benchmark model that is used to calculate CTAR

The benchmark models that are normally used in the *CTAR* method are the reference portfolio approach, Fama French three-factor model or Carhart four-factor model. Mitchell and Stafford (2000) identified that the Fama French three-factor model and Carhart four-factor model wrongly assumes that factor loadings are constant over a relatively long period. This is unlikely since the composition of event portfolio changes overtime. Fama and French (1997) have showed that different industries have different factor loading and Mitchell and Mulherin (1996) document that corporate events tend to cluster through time by industry. Due to this reason the portfolio composition of event firms is likely to be heavily concentrated in a few industries at each point in time but in different industries over a long period. Hence assumption of constant factor loading can lead to biased estimation results under the Fama French three-factor and Carhart-four factor asset pricing models. Lyon et al (1999) further document that the Fama French three factor model wrongly assumes that there is no interaction between the three factors. They argued that this assumption is likely to be violated because they suggested that for small firms there is a significant relation between MV/BV ratio and small firms. Due to these problems associated with these asset-pricing models this study has used reference portfolio approach based on size and MV/BV as the benchmark expected return to determine the *CTAR*. Thus similar to the *BHAR* approach in this study I have used the reference portfolio approach to determine the *CTAR*. The construction of this reference portfolio is given in Section 4.2.2.2 above.

#### 4.2.2.6 Test Statistic for CTAR

To test the null hypothesis that *MSCTAR* is zero the following t-statistic has been calculated:

$$t = \frac{MSCTAR}{\sigma_{\overline{SCTAR}_t}} \quad (4.21)$$

The denominator of Equation 4.21 is the standard error of the monthly standardised *CTAR* denoted by  $\overline{SCTAR}$  in Equation 4.19.

#### 4.2.3 Determinants of the short run announcement period *CARs* and the long run post merger *BHARs* –multiple regression analyses

The short run and the long run event study methodology discussed in Section 4.2.1 and 4.2.2 would help to determine the gains or losses accrued to the shareholders in the short run following the M&A announcement and in the long run following the completion of M&A. The methodology discussed in Sections 4.2.1 and 4.2.2 could not explain the determinants or the sources of the short run and the long run wealth creation following M&A. This Section therefore presents two multiple regression models that would help to determine the sources of shareholder returns in the short run announcement period and in the long run post merger period. In the short run the *CARs* under the OLS market model has been used to examine the determinants of shareholder returns. Since the *CAR* results are consistent across all the three benchmark models so I have selected the *CARs* under the OLS market model to determine the shareholder returns. For the long run I have used the shareholder returns obtained under the *BHAR* method.

Multiple regression analysis allows the assessment of the relationship between one dependent variable and several independent variables (Tabachnick and Fidell, 1996, Chapter 5). It gives the impact of each independent variable on the dependent variable while isolating the influences of other independent variables.

The regression model that estimates short run cumulative abnormal returns of the acquirer and target firms as a function of several explanatory variables is presented in Equation 4.22. The regression model that estimates the long run three year post merger *BHAR* as a function of several explanatory variable is presented in Equation 4.23. Equations 4.22 and 4.23 will specifically examine to what extent the different deal characteristics explains the shareholder returns.

The regression model for the short run *CARs* is given as follows:

$$CAR(-5,+5) = \alpha + \beta_1 PRIV + \beta_2 DEREK + \beta_3 DOM + \beta_4 SSECT + \beta_5 BIDMTB + \beta_6 Log(RELSIZ) + \varepsilon \quad (4.22)$$

*CAR* (-5, +5) is the cumulative abnormal returns accrued to the acquirer and target shareholders in the 11 days event window under the OLS market model surrounding the event date.

Similarly the regression model for the long run three year post merger *BHARs* is given as

$$BHAR = \alpha + \beta_1 PRIV + \beta_2 DEREK + \beta_3 DOM + \beta_4 SSECT + \beta_5 BIDMTB + \beta_6 Log(RELSIZ) + \varepsilon \quad (4.23)$$

The different explanatory variable taken in Equations 4.22 and 4.23 are defined as follows. The first explanatory variable is privatisation (*PRIV*) which is a dummy variable that takes the value of 1 if the firm has been privatised prior to M&A. The



second explanatory variable is deregulation (DEREG) which is also a dummy variable and takes the value 1 if that firm's respective utility sector is fully deregulated in its home country and 0 otherwise. Domestic (DOM) is the third dummy variable which takes the value 1 if the M&A takes place with a firm in its home country and 0 if the M&A is cross border. Same sector (SSECT) is a dummy variable which takes the value of 1 if the M&A take place between same sector (e.g. electric-electric or telecom-telecom mergers) and 0 if it is within cross sectors (e.g. gas-electric mergers). BIDMTB is the explanatory variable that examines whether shareholder returns are explained by the market to book value of the acquirer firms. Relative size (RELSIZ) is the ratio of market capitalisation of the acquirer to the market capitalisation of the target taken two months<sup>44</sup> prior to the event date.

The following Subsections explain the implications of each of these explanatory variables that have been used in the above two regression Equations.

#### **4.2.3.1 Privatisation**

As discussed in Section 3.2 of Chapter 3 this study hypothesize that returns accrued to the target and acquirer shareholders in the short run and the combined firm shareholders in the long run will be explained by the explanatory variable privatisation. This will be examined by the coefficient  $\beta_1$  of the explanatory variable PRIV. If  $\beta_1$  is positive and significant it would imply that shareholders of the utility companies that were previously under state ownership and were subject to

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<sup>44</sup> The market capitalisation data is taken two months prior to the event date so that the stock price is least affected by the influence of acquisition rumours (Rau and Vermaelen, 1998).

privatisation earned higher returns compared to those firms that were under private ownership since their inception.

#### **4.2.3.2 Deregulation**

Table 4.3 presented in Section 4.3 below reveals that not all the utility sectors in all the European countries are fully deregulated. There are still some countries in Europe where some utility sectors are still partly under government control. The coefficient  $\beta_2$  will determine whether the level of deregulation had any impact on shareholder wealth creation following M&A.

#### **4.2.3.3 Domestic versus cross-border M&A**

In Chapter 3 I have hypothesized that for European utility sectors cross-border M&A would generate higher returns compared to domestic M&A. I have also provided the rationale for this hypothesis in Chapter 3. Thus in the context of M&A of European utilities this thesis aims to examine whether domestic or cross-border M&A has a significant impact on the short run acquirer *CARs* and the long run combined firm *BHARs*. In Equations 4.23 and 4.24 dummy variable domestic (DOM) would examine whether the short run and the long run shareholder returns are explained by domestic or cross-border M&A. The coefficient  $\beta_3$  is associated with the explanatory variable DOM. If  $\beta_3$  is not statistically significant then it would imply that there is no difference in shareholder returns between domestic and cross-border M&A.

#### **4.2.3.4 Related versus diversified M&A**

Dummy variable (SSECT) has been used to distinguish between related and diversifying acquisitions. The dummy variable has been set to 1 when the M&A takes place within the same utility sector and 0 under different utility sectors. The coefficient  $\beta_4$  is associated with the explanatory variable SSECT.

#### **4.2.3.5 Acquirer market value to book value ratio of equity (MTBV)**

In Equations 4.22 and 4.23 the independent variable BIDMTB will determine the systematic difference in shareholder returns based on acquirer market to book ratio. The market to book value ratio has been taken two months prior to the M&A announcement date in order to prevent these ratios from getting influenced by the announcement rumours. As mentioned in Chapter 3 if performance extrapolation hypothesis holds then in the short run there will be a positive relation between shareholder returns and acquirer MTBV while in the long run post merger period this relation will be negative. The coefficient of the explanatory variable BIDMTB,  $\beta_5$  is thereby expected to be positive in the short run and negative in the long run.

#### **4.2.3.6 Relative Size**

In the context of M&A of European utilities the relative size of acquirer to target may be one of the factors that influence the acquirer returns. This thesis therefore attempts to examine the relation between relative size of acquirer to target firm and the shareholder returns. So the relative size (RELSIZ) is taken as an explanatory variable.



Relative size is taken as the MV of the acquirer at the end of two months prior to the announcement month 0, over the MV of the target firm at the same time. Logarithmic transformation of the relative size is taken to minimise the impact of outliers. Taking the logarithm will normalise the distribution of this independent variable.

#### 4.2.4 Determination of motives behind the M&A of European utilities

The motives behind M&A of European utilities have been examined using two different approaches. As discussed in Chapter 3 first the motives behind M&A have been analysed by looking at the weighted average of the combined gains of the target and acquirer firms in the twenty one days event window surrounding the announcement date. From the definition of synergy, agency and hubris discussed in Chapter 2 a positive combined gain would imply synergy, a negative combined gain would imply agency and zero combined gain would imply hubris motive behind M&A. The weights are the market values of the firms taken two months prior to the event announcement date. The market values are taken two months before the announcement date so that these values are not influenced by any leakage of news regarding the announcement of the event. This has been examined by the following Equation

$$CAR^i_{Total} = \frac{TargetGain^i + AcquirerGain^i}{MV^i_{Target} + MV^i_{Acquirer}} \quad (4.24)$$

$CAR^i_{Total}$  is the average synergistic gain of firm  $i$ ,  $TargetGain^i$  is the gain (or loss) accrued to the  $i^{th}$  target firm shareholders and  $AcquirerGain^i$  is the gain (or loss) accrued to the shareholders of the  $i^{th}$  acquirer firm.  $CAR^i_{Total}$  is expressed in percentage. This is shown in Chapter 6.

In Equation 4.24

$$TargetGain^i = MV_{Target}^i * CAR_{Target}^i (-10,+10) \quad (4.25a)$$

$$AcquirerGain^i = MV_{Acquirer}^i * CAR_{Acquirer}^i (-10,+10) \quad (4.25b)$$

$MV_{Target}^i$  and  $MV_{Acquirer}^i$  are the market capitalisation of the  $i^{th}$  target firm and  $i^{th}$  acquirer firm respectively. Since the sample of European utility companies that are analysed in this thesis come from different European countries so their market capitalisations are expressed in different currencies. Hence the market capitalisations of different European utilities are converted into the British pound sterling by multiplying with the exchange rate (pound equivalent of the European currencies) on that respective date. The total gains are therefore reported in pound millions<sup>45</sup>. The mean and median combined gains both in absolute and in percentage forms are reported in Chapter 6. The absolute combined gains are obtained by evaluating only the numerator of Equation 4.25. Wilcoxon<sup>46</sup> ranked test is conducted to determine whether the median total gain is statistically greater than zero.

As discussed in Chapter 3 a second approach has been used to determine the motives behind M&A of European utilities. This approach examines the correlation between target gain and total gain and the correlation between target gain and acquirer gain. This allows determination of the simultaneous existence of more than one motive behind M&A of European utility sectors. Table 2.7 in Chapter 2 has shown how the signs of correlation coefficient will help to determine the presence of different motive behind M&A.

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<sup>45</sup> Bradley et al (1988) and Seth et al (2000) have termed this as dollar gains since in these studies the total gains were reported in US dollars.

<sup>46</sup> Wilcoxon signed rank test is a non parametric equivalent of t-test. It is used when the distributional assumptions that underlie t-test is not satisfied. This test is used in several extant studies to determine the statistical significance of the median (Bradley, 1988).



The relation between target gain and total gain has been examined by the following Equation

$$\text{Target gain} = \alpha + \beta * \text{Total gain} \quad (4.26)$$

### *Synergy Theory*

From the hypothesis discussed in Section 3.2 of Chapter 3 if the sign of  $\beta$  is positive then it would imply synergy motive. This is because by definition of synergy total gain is positive. Moreover under synergy target gain is also positive as the targets manage to extract a higher premium from the acquirer through their bargaining power. Due to this reason extant studies have put forward that under synergy motive there would be a positive correlation between the target gain and total gain.

### *Agency Theory*

From the definition of agency motive (presented in Section 2.4 of Chapter 2, p.69) M&A take place due to acquirer managers self interest. So under the presence of agency motive M&A are value destroying in nature. Thus the total gain is negative in this M&A. However as discussed in Section 3.2 of Chapter 3 the target shareholders will tend to extract a higher premium from the acquirer managers. Due to this reason the target gain would be positive even when the total gain is negative. Here the losses to the acquirers are more than offset by the gains to the target firms leading to negative total gains. Hence if there is a negative correlation between target gain and total gain ( $\beta$  is negative) then that would imply agency motive.



### *Hubris Theory*

The hubris theory contends that M&A take place due to acquirer managers' overconfidence or hubris. So total gain is zero under the hubris motive. From the discussion in Section 3.2 of Chapter 3 even under the presence of hubris the target shareholders would extract some premium from the acquirer shareholders. Due to this reason under hubris the gain to target shareholders is exactly offset by losses to acquirer shareholders resulting in zero total gain. Thus if there is no correlation between target gain and total gain ( $\beta$  is zero) then that would imply agency motive.

### *Synergy and Agency*

In order to determine simultaneous presence of both synergy and agency motive, Equation 4.26 has been analysed separately for positive total gain subsample and negative total gain subsample. In Chapter 3 I have shown that if the correlation between target gain and total gain is positive ( $\beta > 0$ ) in the positive total gain subsample and the correlation between target gain and total gain is negative in the negative total gain subsample ( $\beta < 0$ ) then this would imply simultaneous presence of both synergy and agency motives behind M&A.

### *Agency and Hubris*

To determine the presence of both agency and hubris motive Equation 4.26 has been analysed only on the negative total gain subsample. By definition of agency motive the total gain is negative. However if the correlation between target gain and total gain

is zero ( $\beta=0$ ) in the subsample of negative total gain then it would imply simultaneous presence of both agency and hubris motive.

### *Synergy and Hubris*

As shown in Table 2.7 (p.79) of Chapter 2 the presence of motives are also analysed by examining the relation between target gain and acquirer gain. This is represented by the following Equation

$$\text{Target gain} = \alpha + \beta_1 * \text{Acquirer gain} \quad (4.27)$$

By the definition of synergy discussed in Chapter 2 M&A would lead to increase in wealth of the shareholders of both the target and acquirer firms. So if  $\beta_1$  is positive it will imply synergy motive behind M&A. However if  $\beta_1$  is negative (both in the full sample as well as in the subsample of negative total gains) it would imply presence of either hubris or agency or both.

To determine if synergy and hubris hypothesis co-exist in the positive total gain<sup>47</sup> subsample the following Equation has been analysed following Seth et al (2000).

$$\text{Target gain} = \alpha + \beta_1 \text{Acquirer gain} + \beta_2 (\text{Acquirer gain} * \text{Dummy}) \quad (4.28)$$

Dummy = 0 if acquirer gain is positive and 1 if acquirer gain is negative. This dummy is used since the acquirer gain can be negative even though the total gain is positive.

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<sup>47</sup> As discussed in Chapter 2 by definition synergy motive will be present only in the positive total gain subsample. Therefore to determine presence of synergy only the total gains full sample and positive total gains subsample has been examined.

In Equation 4.28 if  $\beta_1$  is positive but  $\beta_2$  is negative it would imply coexistence of both synergy and hubris motives behind M&A. This is because positive  $\beta_1$  implies that there is a positive correlation between target gain and acquirer gain for the subgroup of acquirers with positive gains (evidence of synergy). A negative sign of  $\beta_2$  implies that there is a negative correlation between target gain and acquirer gain for the subgroup of acquirers with negative gains. As mentioned above Equation 4.28 has been analysed on the positive total gain subsample. Hence a negative  $\beta_2$  implies a transfer of wealth from acquirer to target shareholders (evidence of hubris). This is because under the hubris motive the amount of positive gain accrued to the target shareholders is exactly the amount of negative gain or loss that is borne by the acquirer shareholders.

### **4.3 Source of Data Collection and Sample selection**

Given the three research questions that I have presented in Chapter 3 in the previous Section I have provided a detailed presentation of the various methodologies that have been applied to address these research objectives. The purpose of this Section is to discuss the sample selection and the source of data collection.

Data on M&A of European utilities has been collected from Securities Data Corporation Mergers and Acquisition database<sup>48</sup> (SDC). However SDC does not provide information about firm name changes following acquisitions. To obtain this Financial Analysis Made Easy (FAME) and AMADEUS databases have been used to

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<sup>48</sup> SDC provides detailed quantitative information about M&A worldwide. It is the most comprehensive source of M&A worldwide and a major source of data for acquisition related empirical studies (Rau and Vermaelan, 1998; Sudarsanam, 2003; and Conn et al, 2005; Antoniou et al, 2007).



track history of changes to firm name. Data on stock price, market indices, market capitalisation and market to book value, exchange rates have been obtained from DataStream.

The following criteria were applied to identify the sample of European utilities engaged in M&A.

1. Only completed deals have been included in the sample.
2. Both the target and acquirer should be listed companies.
3. The acquirer nation should be any of the European countries
4. The target and acquirer should belong to any of the utilities industry like electricity, gas, water and telecommunications.
5. Only those deals were selected where percentage of shares owned after transaction by the acquirers is more than 50 percent.
6. The study covers M&A for 17 years period with merger announcement date ranging from 1<sup>st</sup> Jan 1990 to 31<sup>st</sup> Dec 2006.

Based on the above criteria 156 mergers and acquisitions deals were identified as sample. The share price data were not available for all the 156 target and acquirer firms. The share price data were obtained for 126 acquirer firms and 96 target firms. Detailed description of the sample companies in terms of year of M&A, utility sector and country of acquisition is given in Tables 4.4, 4.5 and 4.6 below.

Table 4.3 shows the level of privatisation and deregulation of public utilities namely electricity, gas, water and telecommunication in some of the major EU countries. This data has been obtained from ABS energy research 2006. Subsequent to the

deregulation of European utilities, they were subjected to substantial M&A. The deregulation of the European utilities took place in the early 1990s in most of the European countries<sup>49</sup> as discussed in Section 2.2 of Chapter 2. Hence the sample of European utilities that has been examined in this study ranges from January 1990 to December 2006.

**Table 4.3 Level of privatisation and deregulation**

This Table shows the level of privatisation and deregulation activity that took place across different utility sectors in different European countries

	Electricity	Gas	Water	Telecommunication
UK	Full	Full	Full	Full
Germany	Partial	Full	Partial	Full
Italy	Partial	Full	Partial	Partial
France	Partial	Closed	Closed	Partial
Greece	Partial	Closed	Partial	Partial
Austria	Partial	Full	Closed	Closed
Belgium	Partial	Full	Closed	Partial
Netherlands	Partial	Full	Closed	Partial
Spain	Full	Partial	Partial	Full
Portugal	Partial	Partial	Closed	

Source: ABS energy research 2006

- Full = Less than 25% government ownership
- Partial = Between 25% and 75% government ownership
- Closed = More than 75% government ownership

Table 4.4 below shows the distribution of the sample of European utility companies in terms of the form of the deal. Form of the deal here refers to whether the particular deal was a merger or an acquisition. In a merger two companies come together and share their resources to achieve certain objectives. In an acquisition the acquirer firm

<sup>49</sup> The British experiment started earlier in mid 1980s with privatisation of British Telecom in 1984.



purchases the assets or shares of the target firms such that the shareholders of the target firm ceases to be the owners of that firm (Sudarsanam, 2003). So in a merger a new entity is formed whereas in an acquisition the target firms become a subsidiary of the acquirer firm. A takeover is a specific form of acquisition where the acquirer is much larger than the target.

Specifically Table 4.4 shows the distribution of the utility deals across different forms of M&A that has been defined by SDC database. According to SDC database acquisition of majority interests implies that the acquirer firm has purchased a major stake of the target firm. Acquisition of partial interest implies that acquirer firm has purchased a smaller stake of the target firms. As mentioned above in this study only those M&A deals were taken where more than 50 percent of the target shares were acquired. So even after acquisition of partial interest the target shares held by the acquirer is above 50 percent. Acquisition of remaining interest as its name suggests implies that the acquirer firm has purchased the rest of the stakes of the target firms.

From Table 4.4 it is seen that mergers comprises about 34 percent of the total M&A in utility sectors, acquisition of majority interest is about 27 percent of the total sample, acquisition of partial interest and acquisition of remaining interest are 18 and 21 percent respectively.

Table 4.5 below shows the distribution of M&A that have taken place across different utility sectors and the country of the acquirer companies. From this Table it is clear that the bulk of M&A activity has taken place in the electricity sector which accounts for 49 percent of the total M&A that has taken place in the European utility sectors



from 1990 to 2006. This is followed by the telecom sector which accounts for 35 percent.

**Table 4.4 Different forms of M&A deals in European utilities 1990-2006**

This Table presents the distribution of the utility companies in terms of the form of the deal.

	Merger	Acquisition of majority interest	Acquisition of partial interest	Acquisition of remaining interests	Total
1990	1		1	1	3
1991		2			2
1992	1	3		1	5
1993		1	1		2
1994	1	1		1	3
1995	4	1	2	1	8
1996	3	2			5
1997	3	5		1	9
1998	4	3		10	17
1999	7	3	4	3	17
2000	9	5	6	1	21
2001	3	2	2	1	8
2002	3	4	4	1	12
2003	1	2	4	4	11
2004	2	1		2	5
2005	5	5	1	5	16
2006	6	2	3	1	12
	53	42	28	33	156

**Table 4.5 Distribution of M&A of European utility companies across different utility sectors and country of the acquirer firms**

Country\Sector	Electricity	Gas	Water	Telecom	Total
Belgium	3				3
Denmark				3	3
France	2		12	4	18
Finland	7			3	10
Germany	21	2		2	25
Greece				1	1
Italy	2			6	8
Netherlands				1	1
Norway				1	1
Portugal	2				2
Russian Fed	2			2	4
Spain	21	1	1	8	31
Sweden	2			7	9
Switzerland	1			4	5
UK	13	3	6	13	35
Total	76	6	19	55	156

Table 4.6 below shows the spread of the acquirer firms across their country and the year of acquisition. This Table reveals that the UK, Spain and Germany are the three leading countries that had the maximum number of acquirer utility companies that embarked in M&A.

Table 4.7 shows the spread of the target firms across the country of the acquirer firm and the year of acquisition. From the Table it is seen that similar to acquirer sample in the target sample also the UK, Spain and Germany are the top three countries that had the most number of target utility companies that were subject to M&A.

From Tables 4.6 and 4.7 it is seen that the level of M&A activity in the utility sectors started taking pace after 1995. The reason for this phenomenon can be attributed to the fact that most of the European countries started removing the principle of golden

shares<sup>50</sup> during this period. This has removed the restriction on M&A in utility sectors across Europe leading to a surge in M&A. This is further evident from Figure 4.2. This Figure shows that from 1990 to 2006 the maximum number of M&A has taken place after 1995 with the highest being in the year 2000.

Figure 4.3 shows the value of M&A deals in the sample of European utility sectors and the total value of M&A in all the European sectors. This Figure shows that the highest value of M&A in terms of deal size occurred in 1999 both for the European utility sectors and for all European sectors. In fact as indicated in Section 1.3 of Chapter 1, the largest M&A in terms of deal size was recorded in this year between the UK's Vodafone and Germany's Mannesmann.

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<sup>50</sup> The definition of the principle of golden shares has been described in Section 2.2 of Chapter 2. This Section documented that the principle of golden shares were withdrawn from the UK in 1995 and the European Union outlawed the golden shares in 2002.



**Table 4.6 Distribution of the acquirer utility companies across their country of origin and year of M&A**

Country\Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Belgium								1	1	1								3
Denmark															1	1		2
France			1			2		1	1	2	1	1		2		3	1	15
Finland				2		2			1	1		1			1	2		10
Germany			2			1			2	5	4	3	6	2			1	26
Greece											1							1
Italy			1								2		1	1	2	1		8
Netherlands											1							1
Norway																	1	1
Portugal												1	1					2
Russian Fed.											1					1	2	4
Spain	1	2			2		2	4	8	1	5			1	1	3	2	32
Sweden			1		1						3		1			3		9
Switzerland										2	1	1					1	5
UK	2					3	3	3	4	5	2	1	3	5		2	4	37
Total	3	2	5	2	3	8	5	9	17	17	21	8	12	11	5	16	12	156

Table 4.7: Distribution of the target utility companies across their country of origin and year of M&A

Country\Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Argentina											1							1
Belgium								1		1		1		1		1		5
Brazil									1	1	5	1	1					9
Bolivia																	1	1
Canada	1																	1
Chile								4		1								5
Czech Republic								1	1	1				2		2	1	8
France						1			1					2		1	1	6
Finland				2		2			1	1		1	2		1	1		11
Germany			2			1			2	5	2	2	3					17
Greece										1			2	2				5
Hong Kong	1																	1
Hungary										2	2		1					5
Italy			2								1			1	2	1		7
Japan												1						1
Luxembourg											1							1
Netherlands											1			1		3		5
Norway											2							2
Peru											1				1			2
Poland																1		1
Portugal													1	1				2
Russian Fed.											1					1	2	4
South Africa																1		1
Spain	1	2			2		2		8								1	16
Sweden			1		1									1	1		2	6
Switzerland																	1	1
Turkey																1		1
UK						4	3	3	1	1	1	1	2			2	2	20
US									2	3	3	1				1	1	11
Total	3	2	5	2	3	8	5	9	17	17	21	8	12	11	5	16	12	156



Figure 4.2 Number of M&A deals in European utility sectors that is examined in this study

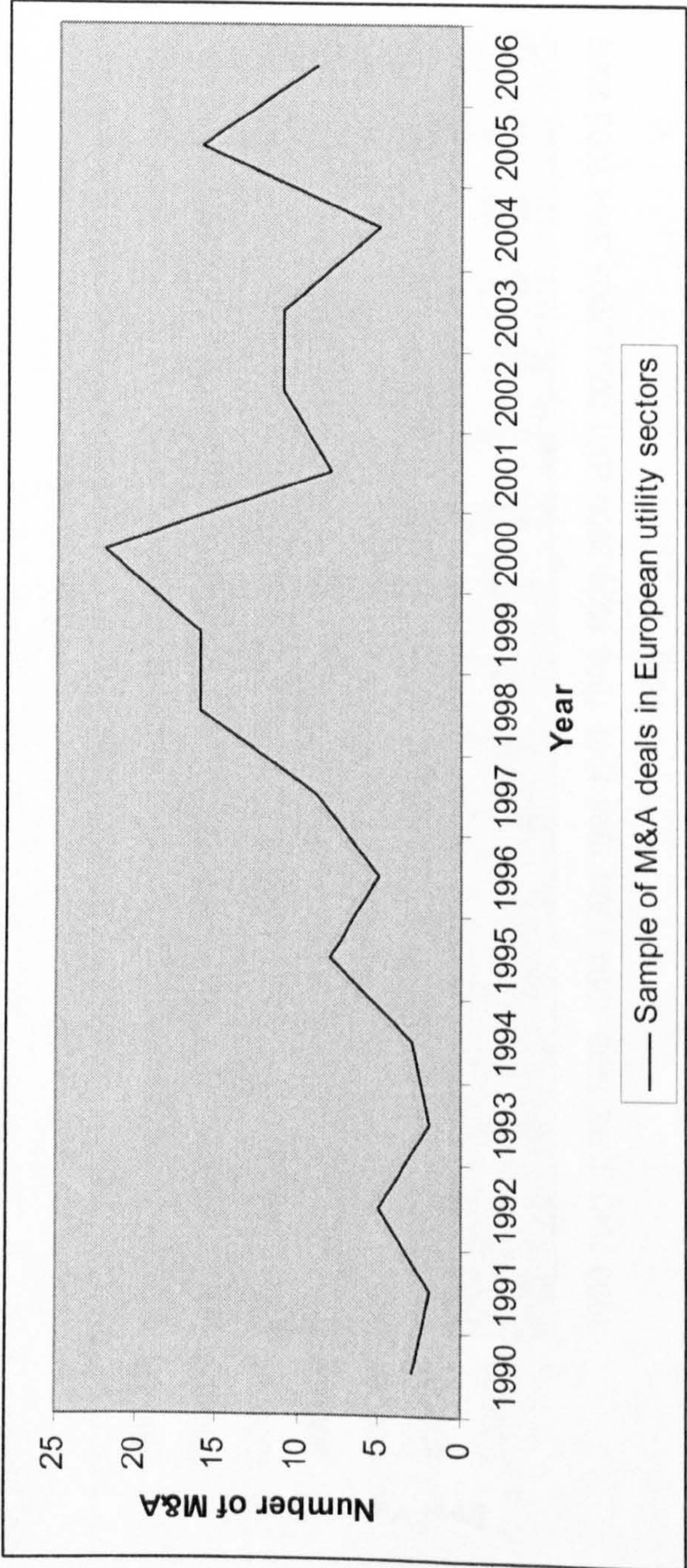
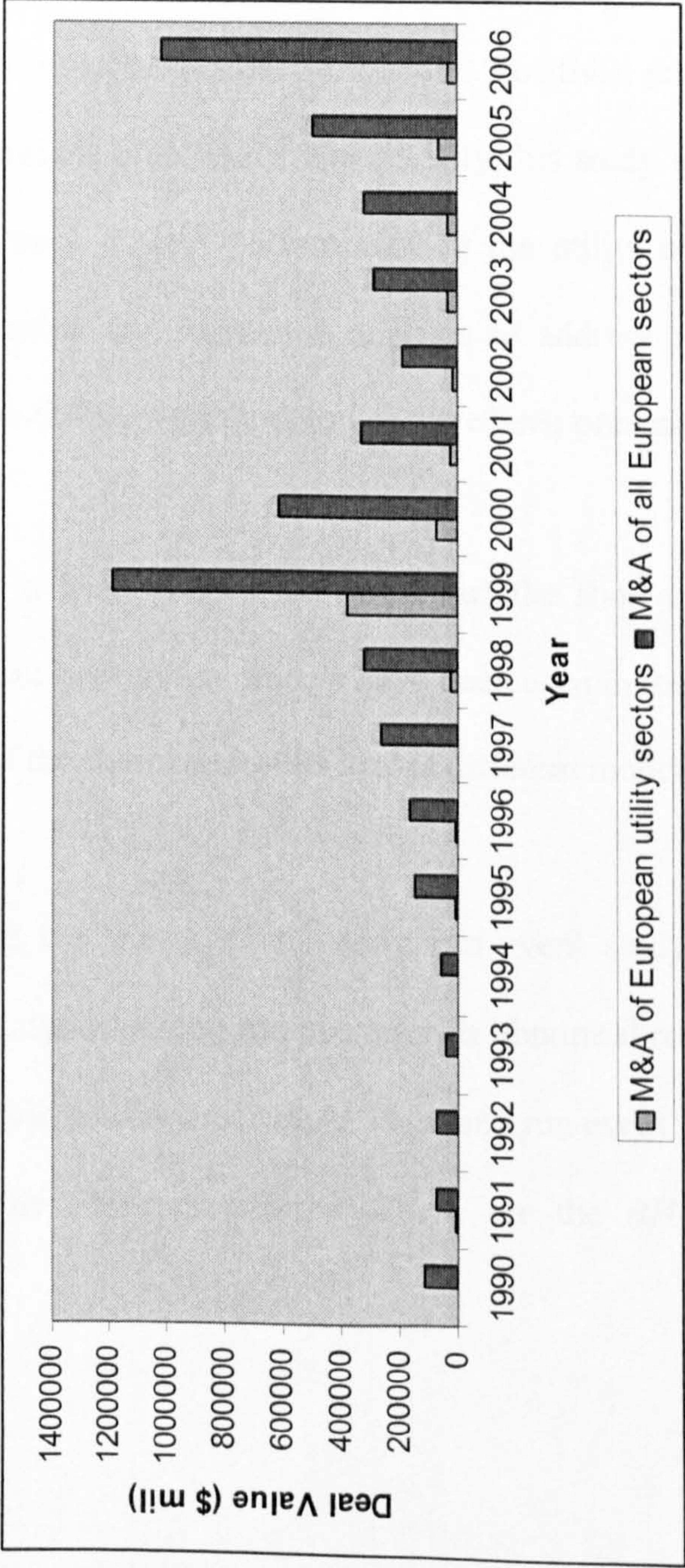




Figure 4.3 Value of M&A deals

This figure compares the value of M&A deals in the sample of European utility sectors that has been analysed in this thesis with the total value of M&A deals in Europe during the time period 1990 to 2006.





## 4.4 Summary

This Chapter has discussed the methodologies that are required to answer the three research question and the source of data and sample selection process that have been used in this research. Firstly Section 4.1 has presented a justification behind the chosen methodologies and the philosophical underpinnings that lies behind these chosen methods. Since this research entails examination of short and long run wealth creation following M&A of utilities and motives behind these M&A so this study has adopted a positivist theoretical perspective. Positivist research paradigm addresses the research questions objectively. Specifically this study carries out short and long run analyses of stock market performance of the utility companies to address the first research question and regression analysis to address the second and third research question. The different methodologies have been presented in Section 4.2.

Specifically in Section 4.2.1 has presented the short run event study methodology. Three different benchmark models have been used in the short in order to examine the robustness of the short run results across different model specifications.

Section 4.2.2 has discussed the long run event study methodology that has been applied to analyze the long run post merger abnormal returns accrued to the combined firm shareholders following M&A. Two long run event study methods have been used to analyse the abnormal returns. These are the *BHAR* approach and the *CTAR* approach.

Section 4.2.3 has presented the methodology to analyse the second research question which intends to examine the determinants or sources of the shareholder returns. The method adopted to determine the motives behind M&A of the European utilities has been presented in Subsection 4.2.4. Finally Section 4.3 has presented the source of data collection and sample selection criteria.

Chapters 5 and 6 will present the findings of the different research questions and their implications.



## Appendix A4.1

The Durbin Watson test statistic is a very popular test to detect serial correlations and it is reported in SPSS while conducting regression (Gujarati, 2003). To correct the autocorrelation problem detected for some securities under the OLS market model the generalised least squares has been applied to the OLS market model given by Equation (4.1). It is assumed that the error term follow first order autocorrelation

$$\mu_t = \rho\mu_{t-1} + \varepsilon_t \quad -1 < \rho < 1 \quad (\text{A4.1})$$

The autocorrelation coefficient is given by  $\rho$  and it is defined as

$$\hat{\rho} = \frac{\sum \hat{\mu}_t \hat{\mu}_{t-1}}{\sum \hat{\mu}_t^2} \quad (\text{A4.2})$$

The Durbin Watson d statistic is given by

$$d = 2\left(1 - \frac{\sum \hat{\mu}_t \hat{\mu}_{t-1}}{\sum \hat{\mu}_t^2}\right) \quad (\text{A4.3})$$

From the A4.2 Equations above it follows that

$$d = 2(1 - \hat{\rho}) \quad (\text{A4.4})$$

Thus in this study when an individual security exhibited either positive or negative autocorrelation it has been corrected as follows.

Following Gujarati (2003) it is assumed that if Equation 4.1 holds at time  $t$  it will also hold true at time  $t-1$ . Hence

$$R_{i,t-1} = \alpha_i + \beta_i R_{m,t-1} + \mu_{t-1} \quad (\text{A4.5})$$

Multiplying by  $\rho$  on both sides of Equation A4.5 we obtain

$$\rho R_{i,t-1} = \rho \alpha_i + \rho \beta_i R_{m,t-1} + \rho \mu_{t-1} \quad (\text{A4.6})$$

Subtracting A4.6 from A4.5 gives

$$(R_{i,t} - \rho R_{i,t-1}) = \alpha_i (1 - \rho) + \beta_i (R_{m,t} - \rho R_{m,t-1}) + \varepsilon_t \quad (\text{A4.7})$$

Where  $\varepsilon_t = (\mu_t - \rho \mu_{t-1})$

Equation A4.7 is also expressed as

$$R_{i,t}^* = \alpha_i^* + \beta_i^* R_{m,t}^* + \varepsilon_t \quad (\text{A4.8})$$

Since the error term of Equation A4.7 satisfies the usual OLS assumptions so it is free from autocorrelation (Gujarati, 2003). In this study the Durbin Watson statistic of all the securities which were affected by autocorrelation showed no autocorrelation when GLS was applied to the revised OLS market model given by Equation A4.8.

## Appendix A4.2

Similar to the OLS market model, the generalised least squares has been applied to the securities that showed the problem of autocorrelation under the world market model. Equation A4.1 to A4.4 of Appendix A4.1 is also repeated under the world market model.

Similar to Appendix A4.1 the world market model at time  $t-1$  is expressed as follows.

$$R_{i,t} = \alpha_i + \beta_{1,i}R_{Lm,t-1} + \beta_{2,i}R_{Wm,t-1} + \beta_{3,i}ER_{j,t-1} + \varepsilon_{i,t-1} \quad (A4.9)$$

Multiplying by  $\rho$  on both sides of Equation A4.9 we obtain

$$\rho R_{i,t-1} = \rho\alpha_i + \rho\beta_{1,i}R_{Lm,t-1} + \rho\beta_{2,i}R_{Wm,t-1} + \rho\beta_{3,i}ER_{j,t-1} + \rho\varepsilon_{i,t-1} \quad (A4.10)$$

Subtracting A4.10 from A4.9 we get

$$\begin{aligned} (R_{i,t} - \rho R_{i,t-1}) &= \alpha_i(1 - \rho) + \beta_{1,i}(R_{Lm,t} - \rho R_{Lm,t-1}) + \beta_{2,i}(R_{wm,t} - \rho R_{wm,t-1}) \\ &+ \beta_{3,i}(ER_{j,t} - \rho ER_{j,t-1}) + (\varepsilon_t - \rho \varepsilon_{t-1}) \end{aligned} \quad (A4.11)$$

Equation A4.11 is also expressed as

$$R_{i,t}^* = \alpha_i^* + \beta_{1,i}R_{Lm,t}^* + \beta_{2,i}R_{Wm,t}^* + \beta_{3,i}ER_{j,t}^* + \varepsilon_t^* \quad (A4.12)$$



As described in Appendix A4.1 Equation A4.12 is free from autocorrelation (Gujarati, 2003). Similar to OLS market model the Durbin Watson statistic of all the securities which were affected by autocorrelation showed no autocorrelation when GLS was applied to the revised world market model given by Equation A4.12.

## **Chapter 5**

### **Wealth effects from M&A of European utilities and determinants of shareholders' returns**

#### **5.0 Introduction**

The aim of this thesis as outlined in Chapter 1 is to examine the causes and consequences of M&A of European utilities from finance theory perspective. To further this aim I have proposed three research questions in Section 3.2 of Chapter 3. The objective of this Chapter is to report the results based on the research questions Q1 and Q2. In order to address these research questions a sample of 156 cases of M&A in utilities has been identified from SDC database from 1990-2006. I have presented the summary statistics of this data in Section 4.3 of Chapter 4.

The first research question as presented in Chapter 3 is given as follows.

**Q1:** What are the (a) short run and (b) long run wealth effects on the European utility companies that were engaged in M&A? Wealth effect of utility companies will be examined (a) in the short run following the announcement of M&A and (b) in the long run following the completion of M&A?

The goal of this research question is to determine whether M&A of European utility sectors has led to increase in shareholders' value. Detailed discussion of methodologies pertaining to examination of shareholder wealth creation is given in Section 4.2 of Chapter 4.

The testable hypotheses pertaining to the short run and long run shareholders' wealth creation following M&A of European utility sectors have been described in Section 3.2 of Chapter 3. Specifically in the context of short run M&A I have hypothesized that due to economic regulation of utility sectors the target and acquirer shareholders will obtain lower returns compared to that reported by empirical evidences in non-regulated industries. The results on the short run shareholder returns based on all the three benchmark models support this hypothesis. In fact the results show that consistent with empirical evidences the target shareholders gained but the acquirer shareholder have earned losses. But the level of gains accrued to the target shareholders is lower compared to non-regulated industries. I will discuss the implications of these short run results further in Section 5.1 below.

In the context of long run post merger change in shareholder wealth creation the proposed hypothesis is that in the post merger period the combined firm shareholders will earn negative returns. As discussed in Section 3.2 of Chapter 3 this hypothesis is based on existing long run evidence in non-regulated industries. But only the 1 year post merger *BHAR* supports this hypothesis. I have discussed this further in Section 5.2 below.

The second research question that this Chapter will address is given by

**Q2:** What are the determinants of the shareholder returns?

The purpose of this research question is to determine the sources or drivers of the short run and long run shareholder returns. The testable hypotheses related to the different characteristics of M&A is given in Section 3.2 of Chapter 3.



The regression results however suggest that most of the coefficients corresponding to different M&A deal characteristics are not statistically significant. In the context of regression on long run post merger returns only the coefficients of the dummy variables privatisation (PRIV) and domestic (DOM) are statistically significant. This suggests that in the context of M&A of European utilities cross-border M&A generate higher returns compared to domestic M&A. The implications of these results have been detailed in Section 5.3 below.

The remainder of the Chapter is structured as follows. Section 5.1 reports the results based on the short run wealth effects of the target and acquirer shareholders following the announcement of M&A of European utilities. Section 5.2 discusses the result based on the long run post merger abnormal returns accrued to the combined firm shareholders. Section 5.3 discusses the overall implication of the results on shareholder wealth creation. In Section 5.4 I report the results obtained on the determinants of the short run and the long run shareholder returns. Finally Section 5.6 provides a summary of the Chapter.

## **5.1 Results on short run stock price performance**

The short run wealth effect following M&A of utilities has been examined by calculating the abnormal returns of the securities surrounding the announcement date. In this Section I report the short run abnormal returns accrued to the target and acquirer shareholders under the three benchmark models. At the end of this Section I have provided the detailed implication of these short run results.

### 5.1.1 Announcement period returns based on the OLS market model benchmark

In Table 5.1, I report the *AAR* in the 11 days event window under the OLS market model. Panel A shows the *AAR* for the portfolio of acquirer firms and panel B shows the *AAR* for the portfolio of target firms. From Table 5.1 it is evident that the *AARs* are mostly negative and not statistically significant for the sample of acquirers except for day 0. On the other hand the *AARs* for the target sample are mostly positive and statistically significant. This result is consistent with the general M&A studies as reviewed in Section 2.3 of Chapter 2 which showed that target firms gained while the acquirer firms either earned zero or negative returns. I will discuss this further in Section 5.1.4 below.

While the *AAR* reports the average abnormal returns of the target and acquirer shareholders on particular dates within the event window the overall inference of the event is determined by the cumulative average abnormal returns *CAAR*. Equation 4.9 in Chapter 4 shows the evaluation of *CAAR* for a particular event window. The announcement period *CAAR* for different event windows under the *OLS* market model benchmark has been reported in Table 5.2. Panel A shows the *CAARs* for the portfolio of acquirer firms while panel B shows the *CAARs* for the portfolio of target firms. It is evident from panel A of the Table that the acquirer *CAARs* are negative in all the event windows. However not all of them are statistically significant.

The target *CAARs* on the other hand are positive in all the event windows. Moreover target *CAARs* are statistically significant at 1 percent level. This result is consistent with the empirical evidence on short run stock price performance of the shareholders



**Table 5.1 Average abnormal return (AAR) of the acquirer and target firms based on the OLS market model benchmark**

This Table reports the average abnormal returns (AAR) for the entire sample of completed mergers and acquisitions (M&A) of the European utilities from 1990 to 2006. Panel A reports the eleven days acquirer AARs surrounding the event date. The eleven days target AARs surrounding the event date are shown in panel B. The AARs are calculated for 106 acquirer firms and 94 target firms whose stock prices were available. The OLS market model is expressed as follows:  $R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$   $R_{m,t}$  is the return on the equally weighted market portfolio on day  $t$ ;  $R_{i,t}$  is the return for security  $i$  on day  $t$ ; In the OLS market model the expected return for each security for both the target and acquirer portfolios are obtained by estimating  $\alpha_i$  and  $\beta_i$ . This is done by regressing security returns  $R_{i,t}$  on the market return  $R_{m,t}$  for the estimation period. The estimation period is 239 days from day -6 to day -244 relative to the M&A announcement date. The expected return  $E(R_{i,t})$  under the OLS market model is given by  $E(R_{i,t}) = \hat{\alpha} + \hat{\beta}R_{m,t}$ . The abnormal returns for each security are calculated as follows:  $AR_{i,t} = R_{i,t} - E(R_{i,t})$ . The abnormal returns for  $n$  securities whose event period coincided on day  $t$  is calculated as follows:  $AR_{p,t} = \frac{1}{n} \sum_{i=1}^n AR_{i,t}$ . The AARs for the  $N$  portfolios for ten days surrounding the event date is calculated as follows:  $AAR_t = \frac{\sum_{p=1}^N AR_{p,t}}{N}$ . The significance of the AAR is tested by t-statistic. \*\* indicates significance at 1% level. The fifth column shows the percentage of abnormal returns that were positive on each day in the 11 days event window.

Panel A: Acquirer AAR based on OLS market model				
Day	N	AAR	t- statistic	%(+)
-5	106	-0.0015	-0.75	48
-4	106	0.0002	0.09	54
-3	106	0.0003	0.15	63
-2	106	-0.0006	-0.30	53
-1	106	0.0009	0.46	59
0	106	-0.0039	-1.92	53
1	106	0.0016	0.76	60
2	106	-0.0005	-0.26	55
3	106	-0.0007	-0.35	57
4	106	-0.0008	-0.40	55
5	106	-0.0016	-0.77	52
Panel B: Target AAR based on OLS market model				
Day	N	AAR	t- statistic	%(+)
-5	94	-0.0010	-0.38	37
-4	94	0.0009	0.34	60
-3	94	0.0071**	2.65	56
-2	94	0.0086**	3.22	55
-1	94	0.0112**	4.19	59
0	94	0.0539**	20.17	66
1	94	0.0120**	4.67	37
2	94	0.0019	0.70	40
3	94	0.0029	1.07	48
4	94	0.0016	0.61	45
5	94	-0.0040	-1.51	38



**Table 5.2 Cumulative average abnormal returns (CAAR) of the acquirer and target firms based on the OLS market model benchmark**

This Table reports the cumulative average abnormal returns (CAAR) of the portfolio of acquirer (Panel A) and target firms (Panel B) for different event windows. The CAAR represents the entire sample of completed M&A of the European utility companies from 1990 to 2006. The M&A announcements are identified from SDC Mergers and Acquisitions Database. The CAAR for an event window (t1, t2) is given as follows:  $CAAR_{t1,t2} = \sum_{t1}^{t2} AAR_t$  . The significance of CAAR is tested by t-test. \*and \*\* indicates the significance at 5% and 1% respectively.

Panel A: Acquirer CAAR based on OLS market model		
Interval	CAAR	t-statistic
(-5,+5)	-0.007005**	-11.35
(-2,+2)	-0.00270**	-2.95
(-1,+1)	-0.00173	-1.46
(0,+1)	-0.00249	-1.72
(-1,0)	-0.00360**	-2.49
0	-0.00436*	-2.13
Panel B: Target CAAR based on OLS market model		
Interval	CAAR	t-statistic
(-5,+5)	0.0954**	118.51
(-2,+2)	0.0880**	73.68
(-1,+1)	0.0775**	50.28
(0,+1)	0.0663**	35.14
(-1,0)	0.0651**	34.45
0	0.0539**	20.17

following the announcement of M&A that has been reviewed in Section 2.3.2 of Chapter 2. Particularly the review of empirical literature in Section 2.3.2 revealed that the short run target *CAARs* lay in the range of 20% to 30%. However in the context of M&A of European utility sectors I find that the target *CAARs* under the *OLS* market model benchmark is less than 5% across all the different event windows. So it is apparent that although the target shareholders of utilities have earned positive returns but these returns are far lower than their counterparts in other non-regulated industries. The implication of this result is given in Section 5.1.4 below.

This research has also used two other benchmark models in order to ensure that the short run stock price performance obtained under the *OLS* market model is robust across different model specifications. These alternate benchmark models are the world market model and the mean adjusted model. The results of stock price performance obtained under these two models have been discussed in Subsections 5.1.2 and 5.1.3.

### **5.1.2 Announcement period results based on the world market model**

The expected return or the normal return under the world market model benchmark is represented by Equation 4.4 of Chapter 4. As discussed in Chapter 4 the world market model developed by Park (2004) incorporates not only the local market index in explaining the return of a security but also it has incorporated the movements in the global market index. Park (2004) argued that due to the integration of the global capital markets the returns of a security are also influenced by movements in the global market index. Hence it is necessary to incorporate a global market index along with a country's local index to determine the normal expected return of a security.

Park (op. cit.) also argued that in most countries security prices readjust in response to simultaneous or lagged movement of foreign exchange. Hence he postulated that foreign currency exchange rate could influence the return of a security. Therefore in the world market model Park (2004) used the foreign currency exchange rate as another explanatory variable.

The rationale provided by Park to use these two additional explanatory variables: the global market index and foreign currency exchange rate is to remove the country specific differences. In the context of M&A of European utility sectors the sample of target and acquiring companies' belonged to different countries. Therefore the sample of target and acquirer firms has different market indices and also different exchange rates. Hence in this study following Park (2004) I have incorporated the world market model to examine the short run shareholders' returns following M&A of European utilities.

However the short run target and acquirer abnormal returns obtained under the world market model is no different from the *OLS* market model. The announcement period *AAR* based on the world market model is given in Table 5.3. From panel A of Table 5.3 it is evident that similar to the *OLS* market model the acquirer *AAR* for the 11 days surrounding the event date are mostly negative. The *AAR* figures are also quite close to that obtained in the *OLS* market model in absolute terms. However all the target *AARs* are not statistically significant. The targets *AAR* as shown in panel B of Table 5.3 are all positive. But only the 3 day *AAR* surrounding the event dates is statistically significant.



**Table 5.3 Average abnormal return (AAR) of the acquirer and target firms based on the world market model benchmark**

This Table reports the *AARs* of the acquirer and target firms based on the world market model benchmark. Panel A reports the eleven days event window *AARs* for the portfolio of acquirers while Panel B reports the *AARs* for the portfolio of target firms. The world market model is expressed as follows:  $R_{i,t} = \alpha_i + \beta_{1,i}R_{Lmt} + \beta_{2,i}R_{Wmt} + \beta_{3,i}ER_t$ . Here the parameters  $\alpha_i, \beta_{1,i}, \beta_{2,i}$  and  $\beta_{3,i}$  are estimated over the estimation period (-6 to -244days prior to the event date) by regressing security return  $R_{i,t}$  on the return of local market index  $R_{Lmt}$ , return on FTSE All World Index as  $R_{Wmt}$ , and relative change of the local currency in terms of US dollars as  $ER_t$ . Under the world market model the expected return  $E(R_{i,t})$  is given by:  $E(R_{i,t}) = \hat{\alpha} + \hat{\beta}_{1,i}R_{Lmt} + \hat{\beta}_{2,i}R_{Wmt} + \hat{\beta}_{3,i}ER_t$ . The abnormal returns for each security are evaluated as follows:  $AR_{i,t} = R_{i,t} - E(R_{i,t})$ . The abnormal returns for n securities whose event period coincided on day t is calculated as follows:  $AR_{p,t} = \frac{1}{n} \sum_{i=1}^n AR_{i,t}$ . The *AARs* for the N portfolios for ten days surrounding the event date is calculated as follows:

$$AAR_t = \frac{\sum_{p=1}^N AR_{p,t}}{N}$$

The significance of the *AAR* is tested by t-statistic. \*\* and \* indicates significance at 1% and 5% level respectively. The fifth column shows the percentage of abnormal returns that were positive on each day in the 11 days event window.

Panel A: Acquirer AAR based on world market model				
Day	N	AAR	t- statistic	%(+)
-5	105	-0.0015**	-0.71	42
-4	105	-0.012**	0.11	50
-3	105	0.001	0.56	53
-2	105	-0.001	-0.59	48
-1	105	0.005	0.28	47
0	105	-0.0056**	-2.65	45
1	105	0.0024	1.13	51
2	105	-0.0008	-0.38	47
3	105	-0.0013	-0.63	52
4	105	-0.0014	-0.65	45
5	105	-0.0035	-1.65	37
Panel B: Target AAR based on world market model				
Day	N	AAR	t- statistic	%(+)
-5	83	-0.00042	-0.15	39
-4	83	0.00085	0.31	55
-3	83	0.0054*	1.96	55
-2	83	0.0067*	2.43	53
-1	83	0.012**	4.30	64
0	83	0.048**	17.40	68
1	83	0.013**	4.56	42
2	83	0.003	1.17	47
3	83	0.003	1.07	41
4	83	0.0014	0.51	50
5	83	-0.0046	-1.67	39

**Table 5.4 Cumulative average abnormal returns (*CAAR*) of the acquirer and target firms based on the world market model benchmark**

This Table reports the cumulative average abnormal returns (*CAAR*) of the portfolio of acquirer and target firms engaged in M&A. Panel A reports the *CAAR*s for the acquirer firm across different event windows while panel B reports the *CAAR*s of the target firms across different event windows. The *CAAR* represents the entire sample of completed M&A of the European utility companies from 1990 to 2006. The M&A announcements are identified from SDC Mergers and Acquisitions Database. The

*CAAR* for an event window ( $t_1, t_2$ ) is given as follows:  $CAAR_{t_1,t_2} = \sum_{t_1}^{t_2} AAR_t$ . The significance of *CAAR* is tested by t-test. \*and \*\* indicates the significance at 5% and 1% respectively

Panel A : Acquirer <i>CAAR</i> based on world market model		
Interval	<i>CAAR</i>	t-statistic
(-5,+5)	-0.0109**	-17.17
(-2,+2)	-0.0046**	-4.94
(-1,+1)	-0.0025*	-2.14
(0,+1)	-0.0032*	-2.15
(-1,0)	-0.005**	-3.35
0	-0.006**	-2.65
Panel B : Target <i>CAAR</i> based on world market model		
Interval	<i>CAAR</i>	t-statistic
(-5,+5)	0.048**	105.71
(-2,+2)	0.059**	66.75
(-1,+1)	0.061**	45.47
(0,+1)	0.073**	31.04
(-1,0)	0.082**	30.69
0	0.088**	17.40

Table 5.4 reports the *CAAR* for the portfolio of target and acquirer firms based on the world market model<sup>51</sup>. The results are again consistent with those obtained in the *OLS* market model. The target *CAARs* are positive in all the event windows and the acquirer *CAARs* are negative in most of the event windows. Moreover all the *CAARs* for both the target and acquirer firms are significant either at one percent or at five percent level. The *CAAR* figures are also quite close to that obtained in the *OLS* market model. From a methodological standpoint it can be concluded that although Park (2004) postulated the need of world market model for examining event study in a multi country settings however the results of the world market model are very close to the *OLS* market model. This again shows the robustness of the *OLS* market model across various sample situations as concluded by Brown and Warner (1985).

### **5.1.3 Robustness check: Announcement period results based on the mean adjusted model**

From Subsections 5.1.1 and 5.1.2 it is seen that the *AAR* and *CAAR* for the portfolio of acquirer and target firms generated consistent result under the *OLS* market model and the world market model. This Section checks the robustness of the *AAR* and *CAAR* reported under the *OLS* market and world market model benchmarks. To do this a third benchmark model has been used which is the mean adjusted model. The expected return under the mean adjusted model benchmark is represented in Equation 4.5 of Chapter 4. The reason behind using the mean adjusted model is to ensure that the short run stock price performance of the target and acquirer shareholders

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<sup>51</sup> The discrepancy in the number of target and acquirer firms between *OLS* market model and world market models is due to lack of availability of data on some of the explanatory variables for some acquirer and target firms under the world market model.



**Table 5.5 Average abnormal return (AAR) of the acquirer and target firms based on the mean adjusted model benchmark**

This Table reports the AARs for the portfolio of acquirer and target firms based on the mean adjusted model benchmark. Panel A reports the eleven days event window AARs for the portfolio of acquirers while Panel B reports the AARs for the portfolio of target firms. In the mean adjusted model the expected return  $E(R_{i,t})$  is the average return of the security over the estimation period which ranged

from -244 days to -6 days of the event date. This is shown as follows  $E(R_{i,t}) = \frac{1}{239} \sum_{t=-244}^{-6} R_{i,t}$  . The

abnormal returns for each security are evaluated as follows:  $AR_{i,t} = R_{i,t} - E(R_{i,t})$  . The abnormal returns for n securities whose event period coincided on day t is calculated as follows:

$AR_{p,t} = \frac{1}{n} \sum_{i=1}^n AR_{i,t}$  . The AARs for the N portfolios for ten days surrounding the event date is

calculated as follows:  $AAR_t = \frac{\sum_{p=1}^N AR_{p,t}}{N}$  . The significance of the AAR is tested by t-statistic. \*\* and

\* indicates significance at 1% and 5% level respectively. The fifth column shows the percentage of abnormal returns that were positive on each day of the eleven days event window.

Panel A : Acquirer AAR based on mean adjusted model				
Day	N	AAR	t- statistic	%(+)
-5	106	0.0020	0.85	50
-4	106	-0.0003	-0.13	49
-3	106	0.0006	0.24	51
-2	106	-0.0017	-0.73	41
-1	106	-0.0016	-0.69	42
0	106	-0.0061**	-2.62	42
1	106	0.0023	0.97	51
2	106	0.0008	0.35	50
3	106	-0.0007	-0.29	47
4	106	-0.0006	-0.26	47
5	106	-0.0008	-0.32	45
Panel B : Target AAR based on mean adjusted model				
Day	N	AAR	t- statistic	%(+)
-5	94	0	0.01	42
-4	94	-0.005	-0.15	55
-3	94	0.0076**	2.57	50
-2	94	0.0083**	2.80	63
-1	94	0.0128**	4.31	60
0	94	0.0607**	20.43	67
1	94	0.0137**	4.62	44
2	94	0.0025	0.85	36
3	94	0.0027	0.94	42
4	94	0.0008	0.28	40
5	94	-0.0037	-1.26	40

**Table 5.6 Cumulative average abnormal returns (CAAR) of the acquirer and target firms based on the mean adjusted model benchmark**

This Table reports the CAAR for the acquirer and target firms based on the mean adjusted model. Panel A reports the acquirer CAARs for different event windows while panel B reports the target CAARs for different event window. The CAAR for an event window (t1, t2) is given as follows:

$$CAAR_{t1,t2} = \sum_{t1}^{t2} AAR_t .$$

The significance of CAAR is tested by t-test. \*and \*\* indicates the significance at 5% and 1% respectively

Acquirer CAAR based on mean adjusted model		
Interval	CAAR	t-statistic
<b>Panel A</b>		
(-5,+5)	-0.0062**	-2.63
(-2,+2)	-0.0078**	-4.74
(-1,+1)	-0.0037*	-2.26
(0,+1)	-0.0054**	-4.02
(-1,0)	-0.0065**	-6.26
0	-0.0059**	-8.43
Target CAAR based on mean adjusted model		
Interval	CAAR	t-statistic
<b>Panel B</b>		
(-5,+5)	0.1052**	117.39
(-2,+2)	0.0981**	73.81
(-1,+1)	0.0872**	50.86
(0,+1)	0.0744**	35.43
(-1,0)	0.0735**	35.00
0	0.0607**	20.43

following the announcement of M&A of European utilities is robust across different model specifications.

Table 5.5 shows the 11 days *AARs* around the event date for the portfolio of acquirer and target firms under the mean adjusted benchmark model. Consistent with the *OLS* market model and world market model the acquirer *AARs* are negative in almost all the 11 days window surrounding the event date. The target *AARs* under the mean adjusted model as shown in panel B of Table 5.5 are positive in almost all the 11 days. Moreover the target *AARs* from -4 day to +1 day is also significant at one percent level. This is consistent with the *AARs* reported under *OLS* market model and world market model.

The results for acquirer *CAARs* as reported in panel A of Table 5.6 are negative across all the event windows. These *CAARs* are also statistically significant at 1 percent level for all the different event windows. The *CAARs* for the target shareholders as shown in panel B of Table 5.6 are on the other hand positive across all the event windows and these are significant at one percent level. Therefore the *CAAR* results for both the portfolios of target and acquirer firms are consistent with the *OLS* market model and world market model.

Hence it can be concluded that the analysis of short run target and acquirer returns following the announcement of M&A of European utility sectors is robust along different model specifications.



#### 5.1.4 Implications of the short run stock price performance

In this study the short run stock price performance following the announcement of M&A of European utility sectors suggests that the target shareholders have earned significant positive returns while the acquirer shareholders have suffered losses. This result is consistent along all the three benchmark models. This result is also consistent with the empirical evidence reviewed in Chapter 2.

The size of target *CAAR* in the (-1, +1) event window for the *OLS* market model, world market model and mean adjusted model are 7%, 6% and 8% respectively. But the review of empirical literature on the short run stock price performance in Chapter 2 showed that the target gains lay between 20 to 30 percent in most of these extant studies. Therefore as discussed in Section 5.1.1 above the size of target gain is quite small when compared to the target gains reported in the empirical studies of M&A in non-regulated industries.

The size of acquirer *CAAR* for the *OLS* market model, world market model and mean adjusted model are -0.1%, -0.2% and -0.3% respectively for the event window (-1, +1) and these are also statistically significant. However the empirical evidence on short run stock price performance in Table 2.2 of Chapter 2 showed that acquirer *CAAR* lay between the range of -3.47% reported by Houston et al (2001) to 1.77% reported by Fuller et al (2002). So from the short run announcement period returns of the acquirer shareholders it is apparent that although the acquirers have earned negative returns but the extent of these negative return is not very high.

These results suggest that M&A of utilities in Europe were not perceived favourably by the market. This is evidenced by the negative *CAAR* accrued to the acquirer shareholders and very low positive *CAAR* accrued to the target shareholders under the three benchmark models. The reason for lower *CAAR* for the shareholders of utility sectors can be attributed to the regulated nature of these sectors.

In Chapter 3 it was hypothesized that in the short run due to the regulated nature of utility sectors the acquirers of utilities will not pay a higher premium to the targets. This is because the acquirers will be sceptical that the regulators of utilities might not allow them to realise these higher premiums after the mergers<sup>52</sup>. Hence the target returns will be lower than that reported in non-regulated industries. Since the results show very low target gains as mentioned earlier so clearly this hypothesis holds true. This result is also consistent with the returns accrued to the target shareholders in the context of M&A of the US electricity sector as reported by Leggio and Lien (2000) and Becker-Blease et al (2008). These studies also had attributed these lower target gains to the regulated nature of utility sectors.

In the case of acquirer shareholders the results suggest that although the returns are negative but they are not as low as those reported by some extant studies on M&A in non-regulated industries. Therefore it is evident that the losses accrued to the acquirer shareholders are less severe compared to that earned by acquirers in non-regulated industries. This result can again be attributed to the regulatory nature of utility sectors. Particularly since utility sectors provide essential service so the role of the regulators is to ensure that these sectors do not suffer losses. Hence the market has reacted less

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<sup>52</sup> This point has also been raised by Leggio and Lien (2000) in the context of M&A of the US electricity sector.



adversely for the acquirers of utility sectors compared to empirical evidences on acquirer returns in non-regulated industries.

However in the context of M&A of the US electricity sector Leggio and Lien (2000) found that the acquirers of the electricity companies have earned more negative returns compared to those in non-regulated industries. This difference in result between the European utility sectors and the US electricity sector can be attributed to the difference in nature of utilities regulation in these two regions.

## **5.2 Long run stock price performance**

In recent years there have been a significant number of extant studies that have examined long run post merger performance. These studies have been reviewed in Chapter 2. The results from these studies provide mixed evidence on the long term post merger stock price performance.

In this Section I discuss the results on the long run post merger stock price performance of the combined entity. In this study the 3 years post completion period has been taken to evaluate the long run performance. As discussed in Chapter 4 in this research two long run abnormal return estimators have been analysed. These are the Buy and Hold abnormal returns (*BHAR*) approach and the Calendar Time abnormal (*CTAR*) returns approach. The details computational procedures for *BHAR* and *CTAR* have been discussed in Section 4.2.2 of Chapter 4.



Section 5.2.1 discusses the long run result based on the *BHAR* approach while Section 5.2.2 discusses the result based on the *CTAR* approach. In Section 5.2.3 I have provided the implication of the long run empirical evidence obtained in this research.

### **5.2.1 Long run stock price performance under the *BHAR* approach**

Table 5.7 shows the long run *BHAR* over the 1 year, 2 years and 3 years holding periods. The results show that the long run *BHARs* over all the three different intervals are negative. The mean long run *BHAR* is -6.6% ( $t = -1.88$ ) in the 1 year post merger period, -3.9% ( $t = 0.80$ ) in the 2 years post completion period and -4.8% ( $t = -1.22$ ) in the 3 years post merger period. However only the 1 year mean *BHAR* is statistically significant at 5 percent level. The significance of the mean *BHARs* are tested by a t-statistic.

The median *BHAR* figures are similar to the mean *BHAR*. The significance of the median *BHARs* are tested by Wilcoxon z-statistic. The median *BHAR* for the 12, 24 and 36 months are -4.6% ( $z = -1.3$ ), -6.5% ( $z = -0.78$ ) and -4.5% ( $z = -1.15$ ) respectively. However none of the median *BHARs* are statistically significant. Table 5.7 also shows that in the 1 year post merger period 44 percent of the utility firms had a positive *BHAR*, in the 2 years post merger period 43 percent of the firms had positive *BHAR* and in the 3 years post merger period 44 percent of the firms experienced positive *BHAR*. Moreover from Table 5.7 it is also clear that the sample size decreases as the analysis moves from 1 year holding period to 3 years holding period. This might be due to the fact that some firms might have got delisted in the 2-

3 years post merger period or some firms might themselves been taken over by other firms.

The *BHAR* result shows that in the three year post merger period the utility firms earned negative returns. The t-statistic shows that only the 1 year holding period *BHAR* is statistically significant.

From the statistically significant negative 1 year *BHAR* result it is apparent that in the 1 year post acquisition period the shareholders of the combined entity suffered significant losses. However since the 2 and 3 years *BHARs* are not statistically significant so no interpretation can be drawn from them. Further discussion on the implication of the long run result is given in Section 5.2.3 below.

**Table 5.7 Long-run buy-and-hold abnormal returns (*BHARs*) of the post merger combined firms following M&A of European utilities with control portfolio approach as benchmark**

This Table reports the long run *BHARs* of the post merger combined firms following their M&A. The *BHARs* are reported over the 1 year, 2 years and 3 years horizons following the merger completion date. The second column reports the number of post merger combined firms. The *BHARs* are calculated using the control portfolio approach with size and market to book value ratio as the benchmark. To determine the size and market to book (MV/BV) matching control portfolios first all the stocks listed in each sample country’s market index have been grouped into 5 portfolios based on their size (market value). Each size (market values) quintiles is further divided into five subgroups based on their MV/BV ratio. Out of these 25 size and MV/BV control portfolios the control portfolio whose size and MV/BV matches closely to a sample firm’s size and MV/BV on the M&A completion month is selected. This control portfolio return is the expected return for the respective sample firm. The *BHAR* is calculated as follows:

$$BHAR_{i,T} = \prod_{t=1}^T [1 + R_{i,t}] - \prod_{t=1}^T [1 + E(R_{i,t})]$$

. The average *BHAR* (*ABHAR*) for the sample of firms in the holding period T ( which is 12, 24 and 26 months) is calculated as

follows  $ABHAR_T = \frac{1}{N} \sum_{i=1}^N BHAR_{i,T}$ . The significance of the mean *ABHAR* is tested by t-statistic and the significance of the median *ABHAR* is tested by Wilcoxon z- statistic. The final column reports the percentage of *BHARs* that were positive.

BHARs for post merger combined firms under the control portfolio approach								
Interval	No.	Mean	t- statistic	Min	Max	Median	z statistic	% positive
(0, +1year)	108	-0.066	-1.88*	-2.140	0.622	-0.046	-1.361	44
(0, +2years)	102	-0.039	-0.80	-1.300	1.092	-0.065	-0.786	43
(0, +3years)	95	-0.048	-1.22	-1.46	1.930	-0.045	-1.154	44



### 5.2.2 Long run stock price performance under the *CTAR* approach

The long run *CTARs* over the interval of 1 year, 2 years and 3 years are shown in Table 5.8. Table 5.8 shows that similar to the *BHARs* in the 3 years horizon the long run *CTARs* are also negative in the entire 3 years interval. The mean *CTARs* for the 1 year, 2 years and 3 year horizons are -1.9% ( $t = -0.022$ ), -1.5% ( $t = -0.197$ ) and -8.3% ( $t = -0.135$ ) respectively. But the t-statistic shows that none of these results are statistically significant. Since none of the *CTARs* are statistically significant so no interpretation could be drawn from them on the long run post merger performance.

### 5.2.3 Implication of the long run results

The hypothesis pertaining to long run post merger performance as outlined in Section 3.2 of Chapter 3 is that in the long run the shareholders of the combined entity will earn negative returns. This hypothesis is made on the basis of existing empirical evidences on the long run post merger performance both in regulated and non-regulated industries. Since the 1 year post merger *BHAR* is negative and statistically significant therefore clearly this hypothesis is accepted. This negative long run *BHAR* is also consistent with the studies of Sudarsanam and Mahate (2003), Conn et al (2005), Gregory and McCorriston (2005) and Antoniou et al (2007) in the context of M&A in non-regulated industries in the UK. Moreover the long run *BHAR* and *CTAR* results are also consistent with the long run results reported in Becker-Blease et al (2008) in the context of M&A of the US electricity companies. The negative and statistically significant *BHAR* in the 1 year post merger period suggests that M&A of utilities in Europe is not a good strategy for utility firms to survive and flourish in the post deregulation period. Another reason for these negative returns could be attributed

**Table 5.8 Long run calendar time abnormal returns of the post merger combined firms following M&A of European utilities with size and market to book adjusted control portfolios as benchmark**

This Table reports the long run calendar time abnormal returns (*CTAR*) of the post merger combined firms. The *CTARs* are calculated in the intervals of 1 year, 2 years and 3 years post merger period following the merger completion date. The *CTARs* are calculated each month as the difference between the event-portfolio return and the expected return on the control portfolio, standardized by the portfolio residual standard deviation. To determine the size and market to book (MV/BV) matching control portfolios first all the stocks listed in each sample country’s market index have been grouped into 5 portfolios based on their size (market value). Each size (market values) quintiles is further divided into five subgroups based on their MV/BV ratio. Out of these 25 size and MV/BV control portfolios the control portfolio whose size and MV/BV matches closely to a sample firm’s size and MV/BV on the M&A completion month is selected. This control portfolio return is the expected return for the respective sample firm. For each calendar month *t* a mean  $\overline{CTAR}_t$  is calculated across the firms as

follows  $\overline{CTAR}_t = \sum_{i=1}^{N_t} \frac{1}{N_t}CTAR_{i,t}$ . *N<sub>t</sub>* is the number of sample firms in the calendar month *t*. The

monthly  $\overline{CTAR}_t$  are standardized by estimates of portfolio standard deviation. The standardized

$\overline{CTAR}_t$  is calculated as follows:  $S\overline{CTAR}_t = \frac{\overline{CTAR}_t}{\sigma_{\overline{CTAR}_t}}$ . A grand mean of the monthly standardized

$\overline{CTAR}_t$  is thereby calculated as follows:  $MSCTAR = \frac{1}{T} \sum_{t=1}^T S\overline{CTAR}_t$ . *T* is the total number of calendar months. The significance of the *CTARs* are tested by means of a t-test.

Interval	<i>CTAR</i>	t- statistic
(0, +1year)	-0.019	-0.022
(0, +2years)	-0.105	-0.197
(0, +3years)	-0.083	-0.135



to the lack of prior experience of the European utilities in acquiring and integrating the merged companies. Moreover the regulatory and safety requirements that the utility acquirers need to maintain also keep them away from more profitable targets. These two points have also been raised by Bertunek (1993) and Ray and Thompson (1990) in the context of M&A of the US electricity companies. Since the 3 years *CTAR* and the 2 years and 3 years holding period *BHARs* results are not statistically significant so no interpretation could be derived from these figures.

From the review of studies in Chapter 2 it is apparent that the general consensus from the short run studies is that the combined gains of the shareholders of the target and acquirer firms are positive<sup>53</sup>. However the extant literature on long run post merger performance reported negative returns being accrued to the combined firm shareholders in the post merger period. Some M&A literature have termed this phenomenon as post merger anomaly (Agrawal et al, 1992; Fama, 1998). Since in this thesis 1 year post merger *BHAR* is negative and statistically significant so it can be concluded that the post merger ‘anomaly’ also holds true in the context of M&A of European utility sectors.

### **5.3 Shareholder wealth creation from M&A of European utility sectors**

In this Section I will discuss the overall implication of the results on the short run and long run stock price performance on shareholders’ wealth.

Bruner (2002) documented that only 20 percent of mergers have succeeded and most mergers typically erode shareholders’ wealth. The review of extant studies in Section

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<sup>53</sup> This is shown in Table 2.6 of Chapter 2.



2.3 of Chapter 2 on shareholders' wealth creation following M&A also reinstated this fact. The significant positive gains accrued to the target shareholders in the short run following the announcement of M&A implied that in most of these M&A there has been a transfer of wealth from the acquirer to the target shareholders (Bruner, 2002). But as mentioned in the previous Chapters most of these studies are based on non-regulated industries.

In the context of M&A of European utility sectors this thesis documents that similar to M&A in non-regulated industries the target shareholders have gained while the acquirers have suffered losses. Moreover similar to non-regulated industries the long run post merger shareholders' returns are also negative. But the difference in the results of this study and the extant studies on M&A in non-regulated industries lies in the fact that in this study I document that the target shareholders have earned very low positive returns. The level of losses incurred by the acquirer shareholders is also quite low. This low target gain and acquirer loss can be attributed to the regulatory nature of utility sectors. As indicated in Section 5.1.4 above on one hand economic regulation of utility sectors might have prevented the acquirers from paying a higher premium to target firms. On the other hand the regulatory bodies would also ensure that utility sectors do not suffer losses. Hence the market did not react too adversely for the acquirer shareholders.

The long run post acquisition result suggests that the combined firm shareholders have incurred significant losses in the 1 year period following the completion of M&A (as evidenced from the statistically significant 1 year *BHAR*). Thus overall the results on shareholder wealth creation following M&A of European utility sectors reinforce the existing evidences of wealth losses from M&A. However it is also

apparent from the results that the extent of this wealth loss is not very severe in comparison to empirical evidences on non-regulated industries. In Chapter 6 I shall report the losses in absolute terms incurred by the shareholders following M&A of European utilities.

## **5.4 Determinants of shareholder returns**

First in this Section I discuss the descriptive statistics of the characteristics of the M&A deals. Second in this Section I report whether the shareholder returns are explained by these different characteristics of M&A. Specifically I examine whether the shareholder returns are explained by the following characteristics of M&A which are privatisation, deregulation, degree of relatedness of the M&A, domestic versus cross-border M&A, value versus glamour M&A and relative size of acquirer to target firms.

### **5.4.1 Descriptive statistics of the characteristics of the M&A deals**

In this Section I present the descriptive statistics of the characteristics of the M&A deals. This is given in Table 5.9.

From the figures in Table 5.9 it is seen that 67.5 percent of the acquirer utilities were subjected to privatisation prior to M&A implying that majority of the European utility companies were under state ownership before being subjected to privatisation, deregulation and finally to M&A. Moreover 69.3 percent of the acquirer utilities are under full deregulation in their home country while the remaining acquirer utilities are either fully or partially regulated.

The percentage of acquirer utilities that acquired the target in their home country (domestic) is 45 percent. This suggests that majority of M&A deals of the European utility sectors are cross-border M&A. The figures also suggest that majority (88.2 percent) of M&A that took place in the European utility sectors are related M&A. The Table also shows that mean acquirer MTBV is 2.68 and the mean of the variable Log (RELSIZ) is 1.02. A mean Log (RELSIZ) of 1.02 implies that on average the acquirer MV is larger than target MV. This in turn indicates that in majority of the M&A deals the size of the acquirers were higher than the targets.

In the next Section I will discuss whether these characteristics of the M&A deals had a significant impact on shareholder wealth creation following M&A.



**Table 5.9: Characteristics of the explanatory variable**

This Table reports the characteristics of the explanatory variable. For the first four control variables the percentage of dummy variable that is equal to 1 has been reported. For the acquirer MTBV (BIDMTB) variable and Log of relative size Log (RELSIZ) their mean and standard deviation has been reported.

Descriptive statistics for the explanatory variables		
Variable	Percentage	
Privatization	67.5	
Deregulation	69.3	
Domestic	45	
Same Sector	88.2	
	Mean	Standard Deviation
Acquirer MTBV	2.682545455	0.301352233
Log (RELSIZ)	1.028038107	0.11120996

## 5.4.2 Determinants of short run stock price performance

Tables 5.10 and 5.11 report the regression results on the determinants of short run announcement period acquirer and target *CARs* during the sample period 1990-2006. In Section 3.2 of Chapter 3 I have discussed the testable hypotheses on the expected outcomes of the regression tests.

The result suggests that the coefficients of privatisation dummy variable (*PRIV*) is 0.006 ( $t = .52$ ) for acquirers and 0.011 ( $t=.317$ ) for targets, which are positive but not statistically significant. Clearly this indicates that the market does not differentiate between M&A of utility sectors which had undergone the privatisation process compared to other utilities which were not subjected to privatisation.

The coefficients of deregulation variable (*DEREG*) is 0.004 ( $t = .305$ ) for acquirers and 0.025 ( $t=.619$ ) for targets which are again positive but not statistically significant. This indicates that in the short run announcement period the market does not differentiate between M&A of European utilities based on their level of deregulation. In Chapter 3 I have hypothesized that under partial deregulation the full benefits of M&A may not be realised. So under partial deregulation the acquirer shareholders will have less incentive to pay a premium for obtaining the target firms. Hence it was hypothesized that gains to target and acquirer shareholders will be higher under full deregulation than under partial deregulation. However the results do not support this hypothesis. This suggests that shareholder returns following M&A are not dependent on the level of deregulation.

Table 5.10: Regression tests of the determinants of announcement period acquirer returns

This Table reports the determinants of the short run announcement period acquirer *CARs* in the event window (-5, +5). The regression model is given as follows:

$CAR = \alpha + \beta_1 PRIV + \beta_2 DERE G + \beta_3 DOM + \beta_4 SSECT + \beta_5 BIDMTB + \beta_6 Log(RELSIZ) + \varepsilon$ . The independent variable *PRIV*= privatisation is a dummy and takes the value of 1 if the utility company was subjected to privatisation prior to merger and 0 otherwise. *DEREG*= deregulation is a dummy variable which takes the value 1 if the utility sector is fully deregulated in its home country and zero otherwise. *DOM* is a dummy variable which takes the value of 1 if the M&A takes place with a company in its home country and 0 if it is a cross border M&A. *SSECT* implies same sector and it is a dummy variable which takes the value of 1 if the M&A takes place within the same sector and zero otherwise. *BIDMTB*=acquirer market to book value and *RELSIZ*= relative size. The t-statistic is given in the parentheses.

Determinants of announcement period acquirer CARs										
Independent Variables	Intercept	PRIV	DEREG	DOM	SSECT	BIDMTB	RELSIZ	F statistic	Adjusted R <sup>2</sup>	No. of observations
Model	-0.02694	0.006803	0.004017	-0.00275	0.020572	0.001113	8.4E-05	0.359006	-0.037	110
t-statistic	[-1.07]	[.52]	[.305]	[-0.22]	[1.11]	[0.582]	[0.325]			
p value	0.28	0.6	0.76	0.82	0.269	0.561	0.974	0.903132		



Table 5.11: Regression tests of the determinants of announcement period target returns

This Table reports the determinants of the short run announcement period target CARs in the event window (-5, +5). The regression model is given as follows:

$CAR = \alpha + \beta_1 PRIV + \beta_2 DERE G + \beta_3 DOM + \beta_4 SSECT + \beta_5 BIDMTB + \beta_6 Log(RE SIZ) + \varepsilon$  . The independent variable PRIV= privatisation is a dummy and takes the value of 1 if the utility company was subjected to privatisation prior to merger and 0 otherwise. DERE G= deregulation is a dummy variable which takes the value 1 if the utility sector is fully deregulated in its home country and zero otherwise. DOM is a dummy variable which takes the value of 1 if the M&A takes place with a company in its home country and 0 if it is a cross border M&A. SSECT implies same sector and it is a dummy variable which takes the value of 1 if the M&A takes place within the same sector and zero otherwise. BIDMTB=acquirer market to book value and RELSIZ= relative size. The t-statistic is given in the parentheses.

Determinants of announcement period target CARs								
Independent Variables	Intercept	PRIV	DEREG	DOM	SSECT	BIDMTB	RELSIZ	No. of observations
Model	0.097087	0.011646	0.024779	-0.0216	-0.01982	-0.00028	0.001765	82
t-statistic	[1.510]	[0.317]	[0.619]	[-0.567]	[-0.405]	[-0.094]	[0.248]	
p value	0.14	0.75	0.54	0.57	0.69	0.93	0.80	
							0.202444	
							-0.063	
							0.975031	

The coefficients of the dummy variable domestic (DOM) is given by -0.003 ( $t = -.22$ ) for acquirers and -0.0216 (-0.567) for targets, which are not statistically significant. This suggests that the short run announcement period acquirer and target *CARs* are not affected by whether the M&A is domestic or cross-border. In Chapter 3 it was hypothesized that since utility sectors are large and capital intensive so cross-border M&A of European utilities will lead to greater returns compared to domestic M&A. This is because the scope of economies of scale and scope are higher for cross-border M&A compared to domestic M&A. The result however does not support this hypothesis. This result is also inconsistent with the study of Cybo-Ottone and Murgia (2000), Corhay and Rad (2000) and Campa and Hernando (2004) in the context of European M&A in non-regulated industries. All of these studies reported that domestic M&A generate higher shareholder returns compared to cross-border M&A. This result is however consistent with study of Lowinski et al (2004) in the context of M&A of Swiss acquirers acquiring domestic and cross-border targets. They had also reported no significant relation between acquirer *CARs* and domestic or cross-border M&A. Lowinski et al (2004) suggested that this is due to the integration of the European markets. It is likely that this argument also holds true in the present context of M&A of European utility sectors.

The coefficients of the dummy variable same sector (SSECT) is 0.021 ( $t = 1.11$ ) for acquirers and -0.0198 ( $t = -.405$ ) for targets are again not statistically significant. This suggests that the market does not distinguish between M&A of related and diversified utilities. This result is not consistent with those of Bertunek et al (1993); Burns et al (1998) and Berry (2000). These studies reported that there is a positive correlation between shareholder returns and diversification in the context of M&A of the US utilities. In the context of European M&A in non-regulated industries Doukas et al



(2001) and Gregory and McCorriston (2005) showed that the acquirer returns are positively correlated with related acquisition compared to diversified acquisition. The authors attributed this result to agency theory where the managers engage in diversifying acquisitions to minimise the business risk. However in the context of M&A of European utility sectors this result does not hold true.

The coefficient of acquirer MTBV (BIDMTB) is 0.001 ( $t = 0.582$ ) for the acquirers which is positive but not statistically significant. Empirical studies have associated firms with higher MTBV as glamour firms and lower MTBV as value firms. Glamour firms are high growth firms with good past performance while value firms are low growth firms with poor past performance. This has been discussed in Chapter 2. Rau and Vermaelen (1998) and Sudarsanam and Mahate (2003) have found that glamour firms have high acquirer returns in the short run announcement period but negative returns in the long run post merger period. The value firms earn the opposite. These studies have termed this phenomenon as performance extrapolation hypothesis. This has been described in Footnote 29 of Chapter 2 (p.58). According to this hypothesis the market extrapolates the past performance of the acquirers when it assesses the value of an acquisition (Rau and Vermaelen, 1998). It implies that glamour managers are more likely to overestimate their own abilities to manage an acquisition (driven by hubris) while value managers are more prudent in approving a major transaction. In the context of M&A of European utilities I find that there is no significant relation between announcement period acquirer returns and its MTBV. Thus in the short run performance extrapolation hypothesis cannot be concluded for the sample of European utilities.



The coefficient of relative size (RELSIZ) again does not show any relation with the short run acquirer and target returns and it is also not statistically significant. As discussed in Section 3.2 of Chapter 3 empirical studies have associated more risk for those M&A where the size of target is larger than the acquirer (Sudarsanam et al, 1996). However in this research I find that the announcement period acquirer returns cannot be explained by the relative size of acquirer to target firms. So this result is inconsistent with the studies of Sudarsanam et al (1996) and Campa and Hernando (2004) which reported a significant relation between relative size and acquirer returns. Both of these studies have examined M&A of European firms in non-regulated industries.

Overall the regression results on the short run announcement period suggest that none of the explanatory variables have any statistically significant impact on the short run announcement period acquirer and target returns. The short run results on the determinants of shareholder returns clearly do not support the hypotheses that were put forward in Section 3.2 of Chapter 3. Moreover as shown above the results on the deregulation dummy (DEREG), domestic dummy (DOM) and relative size (RELSIZ) variable are not consistent with extant studies. The coefficients of the dummy variable same sector (SSECT) and the explanatory variable acquirer MTBV (BIDMTB) are consistent with some studies like Maquiera et al (1998), Rau and Vermaelen (1998), Delong (2001), Doukas et al (2002), Sudarsanam and Mahate (2003) and Megginson et al (2004). But since these coefficients are not statistically significant so no conclusive interpretation can be derived.

### 5.4.3 Determinants of long run stock price performance

Table 5.12 reports the regression results on the determinants of the 1 year, 2 year and 3 years post merger combined firm *BHARs* during the sample period 1990-2006<sup>54</sup>.

The long run result shows that the coefficient of privatisation (*PRIV*) dummy is positive and significant in the 1 year post merger period. The coefficient for this 1 year *BHAR* is 0.267 ( $t=2.26$ ) which is positive and statistically significant at 5 percent level. This implies that in the post merger period the combined firm shareholders of those utility sectors that were previously under state ownership and were subject to privatisation prior to M&A have earned higher returns compared to those which were in private sector since their inception. This suggests that the potential for synergy is higher for the newly privatised utility sectors. The review of studies in Section 2.1 document that privatisation led to increase in efficiency. The higher shareholder returns may thus be attributed to the higher level of efficiency of the newly privatised utility sectors. This is a significant finding of this research and has important policy implications for the investors of utility sectors in Europe.

The coefficients of the dummy variable deregulation (*DEREG*) are not statistically significant for any of the *BHARs* in the 1, 2 and 3 years period. This result therefore does not support the hypothesis that shareholder returns will be higher for M&A of European utilities which are fully deregulated.

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<sup>54</sup> Note that the difference in the number of observations in the regression of 1,2 and 3 year *BHARs* is firstly due to the fact that some firms might have got delisted in the 2-3 years post merger period or some firms might themselves been taken over by other firms as discussed earlier in Section 5.2.1 (p.176) and secondly due to unavailability of data on the independent variables for some of the observations.







Table 5.12 Regression of the determinants of the long run post merger BHARs contd.

Determinants of 3 year post merger BHARs										
Independent Variables	Intercept	PRIV	DEREG	DOM	SSECT	BIDMTB	RELSIZ	F statistic	Adjusted R <sup>2</sup>	No. of observations
Model	0.678298	-0.1152	-0.2425	-0.51463	-0.22406	-0.03025	-0.14722	1.017	0.001	94
t-statistic	[1.34]	[-0.44]	[-0.90]	[-2.05]	[-0.61]	[-0.84]	[-1.29]			
p value	0.182	0.658	0.368	0.043	0.545	0.405	0.202	0.42		

The coefficient of domestic (DOM) dummy is positive and statistically significant at 10 percent level for the 1 year post merger *BHAR*. But the coefficient is not statistically significant for the 2 years post merger *BHAR*. For the 3 years post merger *BHAR* the coefficient is negative and statistically significant at 5 percent level. The positive coefficient for the 1 year post merger period implies that the combined firm shareholders have earned higher returns for domestic M&A compared to cross-border M&A. On the other hand the negative coefficient for the 3 year post merger *BHAR* implies that the shareholder returns are lower for domestic M&A compared to cross-border M&A. One possible interpretation for this result is that for the initial 1 year after the merger completion the utility companies that engaged in cross-border M&A could not earn higher returns because of the existence of legal, cultural and transaction barriers that might prevail across different countries (Campa and Hernando, 2004). There might also be difference in corporate governance structures across different countries as indicated by Corhay and Rad (2000). But as the length of the post merger period increased the utility companies that were involved in cross-border M&A may have overcome these barriers. This is reflected in the negative coefficient of DOM in the 3 years post merger period which indicates the shareholders in cross-border M&A have earned higher returns compared to shareholders in domestic M&A.

Table 5.12 also shows that the coefficients of the dummy variable same sector (SSECT) are not statistically significant in any of the 1, 2 and 3 years post merger period. So the result suggests that there is no difference in post merger shareholder returns between related and diversified M&A. In the context of M&A in non-regulated industries Berger and Ofek (1995), Maquiera et al (1998), Doukas et al

(2001) and Gregory and McCorriston (2005) reported that related M&A created more value to shareholders compared to diversified M&A. On the other hand in the context of M&A of the UK utilities, Loredó and Suarez (2005) argued that diversified M&A has more potential for synergy that could benefit both consumers and producers. However the regression result of the combined firm *BHARs* does not support this diversification argument.

The long run regression result further revealed that none of the coefficients of the independent variable acquirer market to book value (*BIDMTB*) are statistically significant. This result is inconsistent with the performance extrapolation hypothesis suggested by Rau and Vermaelen (1998) and Sudarsanam and Mahate (2003). The performance extrapolation hypothesis states that M&A of growth firms (higher acquirer *MTBV*) are motivated by hubris or overconfidence of the managers while managers of value firms (low *MTBV*) are more prudent in approving an M&A. Hence under performance extrapolation hypothesis the long run shareholders' returns of the combined firms are negatively related with the acquirer *MTBV*. However in the present context the regression result does not support this hypothesis. This in turn suggests that M&A of growth utility firms (higher *MTBV*) are not motivated by hubris. Absence of hubris motive behind M&A of European utility sectors will be further reinforced by the evidences on the motives behind M&A in Chapter 6.

The coefficients of the explanatory variable relative size (*RELSIZ*) are not statistically significant in any of the 1, 2 or 3 years post merger *BHARs*. Thus it is seen that similar to short run regression results the long run post merger returns of the shareholders cannot be explained by relative size of acquirer to target firms.



Overall the multiple regressions of the 1, 2 and 3 years post merger *BHARs* on the explanatory variables suggest that most of independent variables could not explain the returns accrued to the combined firm shareholders in the long run post merger period. Only the coefficients of dummy variables privatisation (PRIV) and domestic (DOM) are statistically significant. The statistically significant positive coefficient of the dummy variable privatisation (PRIV) clearly implies that potential for synergy is higher for the newly privatised utility sectors. The coefficient of the dummy variable domestic (DOM) is significantly positive in the 1 year post merger period but significantly negative in the 3 years post merger period. This result can be attributed to the fact that the legal, cultural and transaction barriers which might have prevented the generation of synergy for the utility companies under cross-border M&A in the initial year following merger completion were overcome in the 3 years post merger period. This is evidenced in the negative coefficient of the dummy variable domestic (DOM) for the regression of the 3 years *BHAR*.

## 5.5 Summary

This Chapter attempted to answer the first two research questions that I have presented in Chapter 3. The results of the announcement period acquirer and target *CAARs* are consistent across all the three different models. The short run result suggests that the target shareholders earned very low positive returns while the acquirer shareholder suffered losses. This result is therefore consistent with M&A in non-regulated industries which report positive target returns and negative acquirer returns following the announcement of M&A.

The positive target returns are however very low compared to that earned in non-regulated industries as reviewed in Chapter 2. This low return is attributed primarily to the perceived risks associated with investing in utility sectors. These perceived risks refer to the fact that due to regulatory intervention the acquirer shareholders might not be able to realise higher target premiums. Hence the acquirers are reluctant to pay a higher target premium. This is reflected in the low positive returns earned by the target shareholders.

The short run announcement period result also revealed that although the acquirer shareholders have suffered losses the level of these losses are lower compared to that reported by empirical literature in non-regulated industries. I have reviewed these studies in Table 2.2 of Chapter 2. This result can be attributed to the regulatory nature of utility sectors. The role of the regulators is to ensure that utilities earn a stable rate of return. Due to this reason the market might have reacted less unfavourably towards acquirers of European utilities compared to acquirers in other non-regulated industries.

The results on the long run returns suggest that in the post merger period the shareholders have suffered losses. But only the 1 year post merger *BHAR* result is statistically significant at 5 percent level. From the long run post merger result it is apparent that M&A of utilities in Europe is not a good strategy for the utility firms to survive and flourish in the post deregulation period. One possible reason for these negative returns is the lack of prior experience of the European utilities to embark in M&A.

Overall the short run and long run results from this study support the existing evidence on wealth losses from M&A. However as the results suggest the extent of these losses are lower than observed in non-regulated industries. This is attributed to the regulatory nature of utility sectors.

The results based on the determinants of shareholder returns suggest that most of the independent variables could not explain the sources of shareholder wealth changes following M&A of European utility sectors. This is evident from the fact that most of the coefficients of the explanatory variables are not statistically significant. Only the coefficients of the dummy variables privatisation (PRIV) and deregulation (DEREG) are statistically significant in the regression of the long run post merger *BHARs*.

In Chapter 6 next I will discuss the empirical evidence obtained on the motives behind M&A of European utility sectors.



## **Chapter 6**

### **Motives behind M&A of utilities**

#### **6.0 Introduction**

The result in Chapter 5 reinforces the existing evidences on shareholder wealth losses from M&A. However despite these wealth losses there is still a continuing trend of M&A. The question that arises from such evidence is: what are the reasons behind these M&A. This is the third question I have put forward in Section 3.2 of Chapter 3 in the context of M&A of European utilities. The purpose of this Chapter is to present the empirical evidence obtained in this study on the motives behind M&A.

As outlined in Section 2.4 of Chapter 2 the M&A literature in finance have advanced three predominant motives behind M&A which are synergy, agency and hubris. Synergy hypothesis implies that M&A are motivated by the economic gains that would emanate from merging the resources of two firms. The hubris hypothesis suggests that M&A occur due to managerial hubris or overconfidence in evaluating the potential gains that would accrue from an M&A. The agency hypothesis entails that M&A are motivated by acquirer managers' self interest at the expense of the acquirer shareholders.

Goergen and Renneboog (2004) documented that in most merger announcements acquirer firms make statements about the potential synergies from M&A. However quite often these projected gains are not realized. This might be either due to

overconfidence or over-optimism of the managers implying managerial hubris or due to agency problems.

In this study I attempt to examine whether the sample of M&A of European utility sectors are motivated by synergy, agency or hubris. To analyse this first I have examined the combined gains of the acquirer and target shareholders following the M&A announcement. In the second method I attempt to distinguish between the different motives behind M&A by performing a correlation analysis of the target, acquirer and total gains accrued to the shareholders following the announcement of M&A. This second method would also help to determine whether there is presence of more than one motive behind M&A in the sample of European utility sectors.

The three motives behind M&A are tied to the shareholders' wealth creation that I have discussed in Chapter 5. For instance under synergy motive it is assumed that managers of the acquirer and target firms intend to maximise shareholders' wealth. So under synergy motive the combined wealth accrued to the shareholders is expected to be positive. Moreover under synergy motive target gains will be positively correlated to both acquirer gains and total gains<sup>55</sup>.

M&A of European utility sectors can also be motivated by agency where the self interest of the acquirer managers is the key reason behind M&A. Under agency motives the combined wealth gain from announcement of M&A will be negative. Moreover as detailed in Section 3.2 under agency motive the target gains will be negatively correlated to both acquirer gains and total gains.

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<sup>55</sup> I have discussed the rationale behind this in Section 3.2.



When M&A take place due to hubris the total gain is zero. This is due to the fact that under hubris the higher the target gain the lower is the acquirer gain such that there is a transfer of wealth from target to acquirer shareholders. Hence sum of gains accrued to the target and acquirer shareholders is zero. Moreover as discussed in Section 3.2 of Chapter 3 under hubris hypothesis the correlation between target and acquirer gain is negative and the correlation between target and total gain is zero.

The evidences obtained on the motives behind M&A of European utility sectors suggest that there is a strong presence of synergy motive behind M&A. This is evidenced from the statistically significant median total gains and positive correlation between target gain and total gain. Moreover presence of agency motive cannot be ruled out since the mean total gain is negative and half of the acquirer gains are negative. However these are not statistically significant. The implications of these results are discussed in Section 6.3.

The remainder of the chapter is structured as follows. In Section 6.1 below I have reported the results based on the combined gains method. In Section 6.2 I have presented the results of the correlation analyses. Finally in Section 6.3 I have discussed the implication of the results that are derived in Sections 6.1 and 6.2.

### **6.1 Combined gains, target gains and acquirer gains**

In this Section I report the result obtained on the motives behind M&A based on the combined gains accrued to the shareholders of the target and acquiring firm. The combined gains are taken as the sum total of target and acquirer gains in the twenty



one days event window surrounding the announcement date. As described in Section 4.2 of Chapter 4 the combined gains are reported in pound sterling (£) millions<sup>56</sup>. The combined gains are also expressed as the weighted average of target and acquirer gains. The weights are the market values of the firms taken two months prior to the event announcement date. The market values are taken two months before the announcement date so that these values are not influenced by any leakage of news regarding the announcement of the event. This has been presented in equation 4.25 of Chapter 4. The combined 21 days cumulative abnormal return (CAR) of the target and acquirer firms surrounding the event date is denoted by  $CAR_{Total}$ .

From the definition and rationale behind the three motives presented in Section 3.2 of Chapter 3 a positive combined gain would imply synergy motive, a negative combined gain would imply agency motive and zero combined gain would imply hubris behind M&A.

The result on the motives behind M&A of European utility sectors based on the combined gains method is presented in Table 6.1. The Table 6.1 shows that in 67 percent of the cases the targets obtained positive gains while in 51 percent cases the acquirers earned positive gains. The total gain is positive in 61 percent cases. This

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<sup>56</sup> As discussed in Section 4.2 of Chapter 4 the combined gains accrued by different utility companies in Europe are converted in British Pound at their historical exchange rates.

**Table 6.1 Combined gains accrued to the target and acquirer shareholders following the announcement of M&A**

This Table reports the combined gains, target gains and acquirer gains over the event window (-10, +10) surrounding the event date. The combined gains have been reported in pound sterling millions. The target gain for a single firm *i* has been calculated as follow: (Target gain)<sub>*i*</sub> = CAR<sub>*i*</sub>(-10, +10)\*MV<sub>*i*</sub>. Similarly acquirer gain for firm *j* has been calculated: (Acquirer gain)<sub>*j*</sub> = CAR<sub>*j*</sub>(-10, +10)\*MV<sub>*j*</sub>. The combined gain is the sum of target and acquirer gains. In this Table the mean and median of the target gains, acquirer gains and total gains have been reported. The statistical significance of the mean total gain, target gain and acquirer gain is determined by t test. The statistical significance of the median total gain is determined by the Wilcoxon signed rank test. \* denote statistical significance at 10 percent level.

The percentage combined gain for each pair of target and acquirer firms has been calculated as follows.

$$CAR_{Total} = \frac{TargetGain + AcquirerGain}{MV_{Target} + MV_{Acquirer}}$$
. As reported in Section 4.2 of Chapter 4 all the three

benchmark models have given similar CAR figures. Therefore only one of the benchmark model CARs have been taken to calculate the total gain, target gain and acquirer gain. In this Table the OLS market model CARs are taken. Since the market value of the sample of European utilities were initially reported in their respective countries' currency so in order to report the results in a single currency (pound sterling) all the market values were converted into pound at their historical exchange rate. The t-statistic for the mean percentage combined gain is given in the parentheses. To evaluate combined gains both the target and acquirer returns are required for an individual deal. So only those pair of deals were taken where both the target and acquirer share price were available. This has reduced the number of deal size to 70.

Total gain over the event window (-10,+10) in £ million (N=70)					
Gain to	Mean	Median	Min	Max	%Positive
Total	-108.32 (-0.207)	46.03 (1.47*)	-28591.51	10493.23	61
Target	313.92 (-2.52)	18.95	-1006.20	7444.49	67
Acquirer	-422.24 (-0.87)	-0.67 (-0.102)	-27585.31	9885.73	50
Combined gain as %of pre-offer market value of target and acquirer firms	-0.007% (-0.43)	0.01	-1.06	0.20	61



suggests that about three fifth of the M&As are motivated by synergy and the rest by agency and/or hubris. Furthermore in 76.7 percent of the cases with positive total gains the acquirer gains are positive. This further indicates that the majority of the acquisitions were motivated by synergy.

Table 6.1 also shows that the mean target gain is £313.42 million and the mean acquirer gain is -£422.24 million. So the mean total gain is -£108.32 million. This indicates that although majority of the M&As are motivated by synergy but the negative gains in absolute terms outweighed the positive gains resulting in a negative mean total gain. However this mean total gain is not statistically significant. From the definition of the three motives behind M&A it is evident that the negative mean total gain indicates agency motive behind M&A. However since this is not statistically significant therefore agency motive cannot be confirmed with certainty.

The median total gain is £46.03 million which is positive and significant at 10 percent level. The significance of the median total gain is examined by Wilcoxon signed rank test. Since median by definition is the medium most value in the list of total gains of the sample of European utilities therefore positive median value further indicates that majority (or at least half) of M&A were motivated by synergy. Since the result indicates that the mean total gain is negative but the median total gain is positive so it implies that negative mean total gains were caused by some large losses incurred by some utility firms from M&A.



Table 6.1 further reveals that percentage total gain denoted by  $CAR_{Total}$  is -0.7%. However this negative  $CAR_{Total}$  is not statistically significant. So again agency motive cannot be confirmed with certainty.

From the result on the combined gain reported in Table 6.1 it is evident that synergy is one of the motives behind M&A of European utility sectors as evidenced by statistically significant positive median total gains. But since the absolute mean total gain and percentage mean total gains are reported to be negative so agency motive cannot be ruled out. However since these values are not statistically significant so agency problem cannot be confirmed with certainty. In order to test the robustness of these results in Section 6.2 next I will present the results on the motives behind M&A of European utility sectors by examining the correlation between target gain and total gain and between target gain and acquirer gain.

## **6.2 Correlation between target gain/ total gain and target gain/acquirer gain**

As discussed in Section 3.2 of Chapter 3 the combined gains figure could not determine the simultaneous presence of two motives behind M&A. Therefore in order to examine two or more motives behind M&A correlation analyses between target, acquirer and total gain have been conducted. The rationale and implication behind adopting this methodology has been discussed in Section 3.2 of Chapter 3.

The expected correlation between target gain and total gain and target gain and acquirer gain under the presence of the three motives was discussed in Section 2.4.2 of Chapter 2. This structure is represented in Table 6.2 below.

**Table 6.2 Correlation structure under the presence of synergy, hubris and agency**

	<i>Correlation between target gain and total gain</i>	<i>Correlation between target gain and acquirer gain</i>
<i>Efficiency or synergy</i>	+	+
<i>Hubris (winner's curse, overpay)</i>	0	-
<i>Agency or managerialism</i>	-	-

### **6.2.1 Result on the correlation between target gain and total gain**

Panel A of Table 6.3 provides the results of the regression model,  $\text{Target Gain} = \alpha + \beta \cdot \text{Total Gain}$ , for the entire sample and for the subsample of positive and negative total gain. For the entire sample the correlation between target and total gain is positive and significant. The estimate of  $\beta$  is 0.094 ( $t = 3.6$ ) which is positive and statistically significant at 1% level. The correlation between target gain and total gain is also positive in the positive total gain subsample. The estimate of  $\beta$  is 0.37 ( $t = 5.9$ ) which is again positive and statistically significant at 1% level. The positive correlation between target gain and total gain in the entire sample as well as in the subsample of positive total gain indicates presence of synergy motive behind M&A of European utility sectors.

In order to determine simultaneous presence of synergy and agency motive the correlation between target gain and total gain is examined in the negative total gain subsample. This is because by definition of agency, total gain should be negative. But as I have indicated earlier under synergy motive correlation between target gain and total gain is positive. So there will be simultaneous presence of synergy and agency motive behind M&A if the correlation between target gain and total gain is positive in the negative total gain subsample. The result in Table 6.3 signifies that in the negative

total gain subsample  $\beta$  is 0.024 ( $t = 1.3$ ) which is positive but not statistically significant. Therefore from this result it is apparent that synergy and agency motives do not coexist in the negative total gain subsample.

As Table 6.2 indicates under presence of hubris there will be zero correlation between target gain and total gain. But the correlation between target gain and total gain is non-zero in the negative total gain subsample as evidenced in Table 6.3. So the coexistence of agency motive and hubris is also ruled out.



Table 6.3 Correlation between target/total gain and target/acquirer gain

Panel A of this table reports the relation between target gain and total gain and panel B reports the relation between target gain and acquirer gain. The equation to evaluate the relation between target gain and total gain is given in column A of panel A. The relation between target gain and acquirer gain is shown in column A of Panel B. The t statistic to test the significance of  $\alpha$  and  $\beta$  has been shown in the parentheses. The F ratio tests the overall fit of the model.  $R^2$  which measures the goodness of fit has been reported in the last column. \*\* and \* indicates the significance at 1% and 5% respectively.

Sample		Size	$\alpha$	$\beta$	F	$R^2$
Panel A: Target gain = $\alpha + \beta(\text{Total gain})$						
Full Sample		70	324.15** (2.8)	0.094** (3.6)	12.63**	0.157
Positive Total gain subsample		43	74.85 (0.48)	0.370** (5.9)	34.61**	0.458
Negative Total gain subsample		27	85.96 0.75	0.024 1.3	1.712	0.064
Panel B: Relation between Target gain and Acquirer gain						
Sample		Size	$\alpha$	$\beta_1$	$\beta_2$	$R^2$
Full Sample: Target gain = $\alpha + \beta_1(\text{Acquirer gain})$		70	332.17** (2.7)	0.043 (1.4)	–	0.028
Positive Total gain subsample: Target gain = $\alpha + \beta_1(\text{Acquirer gain}) + \beta_2(\text{Acquirer gain} * \text{dummy})$		43	370.47 (1.5)	0.137 (1.2)	134.73 (0.29)	0.032
Negative Total gain subsample: Target gain = $\alpha + \beta_1(\text{Acquirer gain})$		27	69.450 (0.590)	0.016 (0.82)	–	0.026

### ***6.2.2 Result on the correlation between target gain and acquirer gain***

The correlation result between target gain and acquirer gain is given in Panel B of Table 6.3. The result shows that the estimate of  $\beta_1$  is 0.043 ( $t = 1.4$ ) which is positive but not statistically significant. Since  $\beta_1$  is positive but not statistically significant therefore presence of synergy motive cannot be concluded.

In the positive total gain subsample the correlation between target gain and acquirer gain is examined with the following equation: Target gain =  $\alpha + \beta_1$ Acquirer gain +  $\beta_2$  (Acquirer gain\*Dummy). Dummy = 0 if acquirer gain is positive and 1 if acquirer gain is negative. This dummy is used since the acquirer gain can be negative even though the total gain is positive. So the dummy variable is used to examine the correlation between target gain and acquirer gain when the acquirer gain is negative.

In the above equation if  $\beta_1$  is positive but  $\beta_2$  is negative it will imply coexistence of both synergy motive and hubris behind M&A. This is because by definition of synergy a positive  $\beta_1$  implies that there is a positive correlation between target gain and acquirer gain. A negative  $\beta_2$  on the other hand implies negative correlation between target gain and acquirer gain for the subsample of acquirers with negative gain. So under negative  $\beta_2$  there is a transfer of wealth from acquirer to target shareholders. By definition of hubris total gain from M&A is zero. Thus under hubris a positive target gain is generated from a transfer of wealth from acquirer to target shareholders. Hence negative  $\beta_2$  entails hubris hypothesis. Thus when  $\beta_1$  is positive but  $\beta_2$  is negative it suggest coexistence of both synergy motive and hubris behind M&A.



Given this hypothesis the result in Panel B shows that there is a positive correlation between target gain and acquirer gain for both the subgroups of acquirers with positive and negative total gains. The estimate of  $\beta_1$  is 0.137 ( $t = 1.2$ ) and  $\beta_2$  is 134.73 ( $t = 0.29$ ). However both the estimates of  $\beta_1$  and  $\beta_2$  are not statistically significant. So the result clearly indicates that there is no simultaneous presence of synergy motive and hubris in the sample of M&A of European utility sectors.

In the negative total gain subsample the correlation between target gain and acquirer gain is positive. This is examined with the equation: Target gain  $= \alpha + \beta_1$  (Acquirer gain). The estimate of  $\beta_1$  is 0.043 ( $t = 1.4$ ) which is again not statistically significant. Hence presence of synergy motive cannot be confirmed in the negative total gain subsample. This in turn rejects the possibility of simultaneous presence of both synergy and agency motive (since there is presence of agency motive in the negative total gain subsample by its definition).

The interpretation of the results based on the motives behind M&A of European utilities as reported by Table 6.1 and 6.3 is given in the Section 6.3 below.

### **6.3 Synergy, Agency or Hubris? – Summary and Implication**

The result based on the combined gains method showed that the median combined gain is positive and statistically significant. This clearly suggests presence of synergy motive behind M&A of European utility sectors. Moreover the fact that 61 percent of the total gains are positive (as shown in Table 6.1) also strengthens this conclusion. The presence of synergy motive is also reinforced in the regression results reported in Panel A and Panel B of Table 6.3. Particularly the regression result showed that there



is a significant positive correlation between target gain and total gain both in the entire sample as well as in the subsample of positive total gain. Hence presence of synergy motive behind M&A of European utility sectors is evidenced from both the combined gains method as well as from the regression analysis.

The sources of synergy in the context of M&A of European utility sectors could be due to operational synergy, financial synergy or strategic realignment. This synergy motive might have stemmed from the deregulation itself. This is because deregulation removed the barriers for the utility companies and allowed them to embark in takeovers which generate synergies. This point has also been posited by Leggio and Lien (2000) and Becker-Blease et al, (2008) in the context of M&A of US utilities.

The combined gains method further reported that the mean combined gain and percentage combined gains are both negative. However these figures are not statistically significant. Since these negative combined gains are not statistically significant so presence of agency motive cannot be confirmed with certainty. The correlation result in panel A of Table 6.3 also does not support agency motive. But since two-fifth of total gains and half of the acquirer shareholders' gains are negative so presence of agency motive cannot be ruled out.

The presence of agency motive implies that there is a fraction of utility companies which embarked in M&A due to the self interest of the acquirer firm managers<sup>57</sup> at the cost of their shareholders. However there is no negative correlation between target gain and acquirer gain in any sub samples. Hence it can be concluded that the agency problem is not very severe.

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<sup>57</sup> See definition of agency motive in chapter 2.

There is no evidence of presence of hubris from the combined gains method. As indicated in Section 3.2 of Chapter 3 the hubris hypothesis implies that there will be zero correlation between target gain and total gain and negative correlation between target gain and acquirer gain. Clearly the result in Table 6.3 also does not support hubris. The absence of hubris also suggests that the acquirer managers of European utilities did not embark in M&A out of their overconfidence or over-optimism.

Overall from the empirical evidence on the motives behind M&A it is clear that synergy is the predominant motive behind M&A of European utility sectors. However since the mean combined gain and half of the acquirer gains are negative so presence of agency motive cannot be ruled out. But clearly there is no managerial hubris in the context of M&A of European utility sectors. This is apparent from both the combined gains method as well as from the regression analysis.

The strong evidence of synergy motive and some presence of agency motive behind M&A of European utility sectors are consistent with other studies on motives behind M&A that have been reviewed in Tables 2.6 and 2.8 of Chapter 2. Moreover all the studies reviewed in Chapter 2 showed presence of more than one motive behind M&A (e.g. Berkovitch and Narayanan, 1993; Seth et al, 2000; Fernandez and Baixauli, 2003; Goergen and Renneboog, 2004). Therefore the presence of both synergy and agency motive behind M&A of the European utilities is consistent with these empirical evidences. Thus this study contributes to the body of evidence on motives behind M&A.



## **Chapter 7**

### **Summary, Conclusions and Implications**

#### **7.0 Introduction**

As outlined in Chapter 1 traditionally finance literature on M&A is based on the examination of two broad questions. First it focuses on analysing the shareholder value creation following M&A and second it rests on examination of the motives behind M&A. The evidence from extant studies reviewed in Chapter 2 suggested that empirical evidence on the motives behind M&A is not very conclusive. Most studies suggested synergy as the predominant motive however presence of other motives like hubris and agency are not ruled out. The empirical evidence on impact of M&A on valuation of firms is less ambiguous. The general consensus in finance literature is that M&A usually result in loss for the acquirer shareholders and gain for the target shareholders in the short run following the announcement of M&A (Martynova and Renneboog, 2008). Finance literature also documents that the combined firm shareholders have suffered losses in the post merger period.

This thesis contributes to this debate in finance in the context of M&A of European utilities. Specifically I set out to investigate the impact of M&A on the valuation of European utilities and the rationale that explains the motives behind M&A decisions in European utilities. The choice of situating the research in the context of European utilities was inspired by many factors. These factors are: the increasing number of M&A deals in the European utility sectors following privatisation and liberalisation,



the presence of economic regulation of these utilities and the size and importance of these utilities for the economy in general and for the consumer welfare in particular. Therefore M&A in utilities is a subject of interest to policy makers, investors and consumers. All these factors have prompted this research.

Given these rationales the aim of this thesis is to examine the causes and consequences of M&A of European utility sectors from a finance theory perspective. The purpose of this Chapter is to gauge the extent to which these aims have been addressed.

In the light of this discussion as presented in Section 3.2 of Chapter 3 the following three research questions were identified:

Q1: What are the (a) short run and (b) long run wealth effects of the European utility companies that were engaged in M&A? Specifically wealth effect of the utility companies will be examined (a) in the short run following the announcement of M&A and (b) in the long run following the completion of M&A.

Q2: What are the determinants of the shareholder returns following M&A?

Q3: What are the motives of the utility companies to engage in M&A?

Results in this study confirm some of the claims about motives behind M&A and the likely impact of the M&A on the firm valuation around announcement period. However, there are also some important differences in the findings of this study in comparison to earlier studies. I will discuss these findings and their implications in detail in Sections 7.1 and 7.2 below.

In this final Chapter, Section 7.1 summarises the main empirical findings of this thesis. In Section 7.2 I discuss the findings of my research from theoretical and policy perspectives. Section 7.3 presents the limitations of my research and possible future developments of my work.

## **7.1 Summary of empirical findings of this thesis**

This Section summarises the main empirical findings of this thesis. The implications of this result will be discussed in Section 7.2.

### ***7.1.1 Summary of results on shareholder wealth creation following M&A of utilities***

Sections 5.1 to 5.3 of Chapter 5 present the results on the question of shareholder value creation following M&A of European utilities both in the short run following the announcement of M&A as well as in the long run post acquisition period. The findings of this study shows that in the short run the target shareholders have earned positive returns while the acquirer shareholders have suffered losses. These findings are consistent to the numerous empirical studies on short run shareholder wealth creation following M&A that I have reviewed in Section 2.3.2 of Chapter 2 (e.g. Maquieira et al, 1998; Mulherin and Boone, 2000; Houston et al, 2001; Fuller 2002; and Moeller, 2004, Conn et al., 2005). However there is a notable difference in the results of this study and earlier empirical evidence which has looked at M&A of non-regulated industries. This difference lies in the fact that this study documents that levels of gains accrued to the target shareholders and the level of losses suffered by the acquirer shareholders are both lower in comparison to those reported in the literature on non-regulated industries. This finding has important policy implications



for the regulated utility sectors. I will discuss this in Section 7.3 below. This result is also consistent with the empirical studies of M&A in the regulated US electricity sector as indicated in the studies of Leggio and Lien (2000) and Becker-Blease et al (2008).

The long run post acquisition result showed that the combined firm shareholders have earned significant losses in the one year post merger period following the completion of M&A. This is evidenced from the statistically significant 1 year average *BHAR*. This negative long run average *BHAR* is also consistent with the studies of Sudarsanam and Mahate (2003), Conn et al (2005), Gregory and McCorriston (2005) and Antoniou et al (2007) in the context of M&A in non-regulated industries in the UK. Moreover the long run results of this thesis are also consistent with the long run results reported by Becker-Blease et al (2008) in the context of M&A of the US electricity sector. Thus the findings of this thesis provide support for a variety of existing studies across a range of sectors.

### ***7.1.2 Summary of results on the determinants or drivers of shareholder returns***

The second part of Chapter 5, particularly Section 5.4, has looked into the determinants of shareholder wealth creation following M&A. Specifically I have examined whether short run target and acquirer returns and long run post merger returns are explained by different explanatory variables, which were privatisation, deregulation, degree of relatedness, cross-border versus domestic M&A, value versus glamour M&A and relative size of acquirer to target firms. This is the first study that has examined the change in shareholder returns with respect to the explanatory variables privatisation and deregulation. In Section 3.2 of Chapter 3 I have outlined



the testable hypotheses pertaining to the impact of the different explanatory variables on shareholders' returns.

The findings suggest that none of the explanatory variables have any statistically significant impact on the short run target and acquirer shareholder returns. This result is inconsistent with the majority of empirical studies on M&A in non-regulated industries which have reported that the short run target and acquirer returns could be determined by the different M&A characteristics. This is a significant finding as I will discuss in the next Section.

When multiple regression is conducted on the long run combined firm *BHARs* the result shows that only the coefficients of the dummy variables privatisation (PRIV) and domestic (DOM) are statistically significant. Specifically the result reveals that the coefficient of the privatisation (PRIV) dummy is positive and significant in the 1 year post merger period. This result clearly indicates that the potential for synergy is higher for the newly privatised utility firms in comparison to those firms which were in private sector since their inception. This is a very interesting and significant result which might influence the investors of utilities in taking important strategic decisions on M&A. The possible inference of this outcome will be discussed in the next Section.

The result on the determinants of shareholder returns further shows that the coefficient of the dummy variable 'domestic' is positive for the 1 year post merger period but negative for the 3 years post merger period. Both of these are statistically significant. This suggests that for the initial 1 year post merger period the utility firms in domestic M&A earned higher returns compared to the utility firms in cross-border

M&A. This clearly indicates that the initial obstacle that the utility firms faced in reaping profits from cross-border M&A were overcome as the length of the post merger integration period increased.

Overall the results demonstrated that contrary to empirical evidence on M&A in non-regulated industries most of the explanatory variables do not have any statistically significant impact on shareholder returns. This result indicates that shareholder value creation following M&A in European utility sectors is not explained by the same factors that explain the shareholder wealth creation following M&A in non-regulated industries. Moreover one of the distinguishing findings of this study is that in the post merger period shareholder wealth creation is greater for the newly privatised utility sectors. Another significant finding of this study is that in the 1 year post merger period the shareholders in cross-border M&A earned lower returns compared to the shareholders in domestic M&A. But this result is revised in the 3 years post merger period where the shareholders in cross-border M&A earned higher returns in comparison to shareholders in domestic M&A.

### ***7.1.3 Summary of results on the motives behind M&A of utilities***

This thesis has particularly examined the ex ante motives behind M&A based on the ex post announcement period results. The findings, based on the total gains figure, provide evidence of the presence of synergy motive behind M&A of utilities. This is evidenced from the fact that the median total gain is £46.03 million, which is statistically significant. Moreover 61 percent of the sample M&As reported that the total gain is positive which further suggests the presence of synergy motives behind M&A in the European utility sectors. But the absolute mean total gain and percentage



mean total gain are reported to be negative. So an agency motive behind M&A cannot be ruled out. However these figures are not statistically significant so any agency motive behind M&A of European utility sectors cannot be confirmed by this study. The fact that the median total gain is positive but the mean total gain is negative also suggests that a few utility companies have accrued huge losses which have wiped out the gains earned by the other utilities resulting in a negative mean total gain.

Moreover neither the combined gains result nor the correlation result provided evidence on hubris hypothesis behind M&A of European utility sectors. Hence presence of hubris is ruled out in the context of M&A of European utility sectors.

The correlation result between target gain and total gain, and target gain and acquirer gain, also suggests that synergy is the predominant motive behind M&A. Hence the presence of synergy motive behind M&A of European utility sectors is robust across both the combined gain result and the correlation result. Hence from these results it can be concluded that synergy is one of the predominant motives behind M&A of European utility sectors.

The findings of this study add support to the extant literature as most of the empirical studies to date have reported that synergy is the predominant motive behind M&A (Berkovitch and Narayanan, 1993; Seth et al, 2000; Fernandez and Baixauli, 2003; Goergen and Renneboog, 2004).



## 7.2 Implication of results and contribution

The findings of this thesis have several implications not only for research in utility sectors but also for existing M&A literature in finance. Moreover as discussed in the beginning of Chapter 1 the importance of utility sectors for the consumers and for the economy at large cannot be overstated. Hence the findings of this study also have important implications from the perspectives of the regulators and policy makers. Furthermore the findings of this study also have important implications for the investors of the utility sectors in taking significant strategic decisions of M&A in utility sectors. This section summarises the key implications of the findings reported in the previous section.

First this thesis attributes the lower level of target gains and acquirer losses in the short run announcement period to the regulatory nature of utility sectors. Since one of the key objectives of privatisation was to encourage competition so consolidation of utility sectors following privatisation and deregulation may reduce the level of competition in these sectors. This is because M&A of European utilities may shift the market power in the hands of few large dominant utility companies. As outlined in Section 1.3 of Chapter 1 due to economic regulation, M&A in utility sectors may have to pass the additional<sup>58</sup> hurdle of regulatory approval from the specific regulators of utilities. Therefore due to this threat to competition the regulators of utilities are very careful in approving M&A. In addition in Section 1.1 of Chapter 1 I have indicated that one of the objectives of the regulators is to balance the interests of the producers and consumers (Parker, 2003). Hence after the merger completion the regulators may

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<sup>58</sup> As discussed in Section 1.3 of Chapter 1 M&A in utility sectors has to pass the hurdles of getting approval from the antitrust authorities as well as from the specific regulators of utility sectors.

disallow the recovery of premiums paid to targets by not allowing the acquirer shareholders to earn supernormal profits. So it is highly likely that due to this regulatory intervention the acquirers of utility sectors have little incentive to bid for a target firm at a significant premium above the market value. This argument has also been put forward by Leggio and Lien (2000) in the context of M&A of the US electricity sector. All these factors contribute to a finding which suggests that the target shareholders from M&A in European utility sectors have earned lower returns compared to their counterparts in non-regulated industries.

Second the lower level of acquirer losses in utility sectors can be attributed to the specific characteristics of utility sectors and economic regulation of these sectors. Particularly since utility sectors provide essential services, so the regulators of these sectors make sure that these sectors are able to earn a stable rate of return. This is because the regulators need to ensure that important sectors like utilities do not suffer from market failure, which will have serious social and economic consequences. For this reason the market might have reacted less severely towards the acquirers of utilities following M&A in comparison to acquirers in other non-regulated industries.

Third the implications of negative long run returns as evident from the findings of this thesis are as follows.

1.) The negative long run result in this thesis can be attributed to the lack of prior experience of European utilities in the acquisition process to acquire other utility companies. Ray and Thompson (1990) and Bertunek et al (1993) also suggested a similar line of reasoning in the context of M&A of the US utilities. This lack of experience in pursuing a strategy of M&A has arguably led to a poor ability to achieve integration and thereby synergy in the post merger period.



2.) As discussed in Chapter 5 the post merger negative returns also suggest that M&A is not a good strategy for the investors in utility firms to flourish in the long run (Leggio and Lien, 2000).

3.) The negative long run returns in this study may also suggest that if synergies existed in M&A of utilities they were passed to other industry stakeholders. For instance, if the mergers bring in lowering of prices then that might be beneficial for the consumers. This point has also been put forward by Becker-Blease et al (2008) in the context of M&A of the US utilities. However further research is required to support this argument in the context of M&A of European utility sectors.

4.) The general consensus from short run announcement period results on M&A is that the returns of the target and acquirer firms taken together are positive. In other words the combined gain is positive. I have documented this in Table 2.6 of Chapter 2. The review of extant studies on post merger performance in Section 2.3.3 of Chapter 2 revealed that most of these studies reported negative returns accrued to the shareholders in the long run post merger period. Extant literature has termed this variance in the short run and long run results as post merger 'anomaly' (Agrawal et al, 1992; Fama, 1998). In this study I find statistically significant negative 1 year post merger average *BHAR* in the context of M&A of European utility sectors. Hence the findings of this thesis re-establishes the post merger 'anomaly' in the context of M&A of European utility sectors.

Overall my results with respect to shareholder wealth creation following M&A in utility sectors are consistent with the extant literature. However the extent of wealth losses is not very severe due to economic regulation of these sectors. This is apparent specifically from the lower level of losses suffered by the acquirer shareholders in the short run following the announcement of M&A. Moreover the long run result also



shows that only the 1 year post merger average *BHAR* is negative and statistically significant. Hence it can be concluded that the findings of this thesis on shareholder value creation is in line with the findings of the empirical literature on M&A in non-regulated industries.

Fourth in the context of the determinants of shareholder returns the findings suggest that the shareholders have earned lower returns in cross-border M&A, compared to domestic M&A, for the initial 1 year post merger period. This result is consistent with the empirical literature on M&A in non-regulated industries in Europe which reported that domestic M&A generate higher returns compared to cross-border M&A (Cybo-Ottone and Murgia, 2000; Corhay and Rad, 2000; Goergen and Renneboog, 2004 and Campa and Hernando, 2004). This is possibly due to the cultural, legal or transaction barriers that exist between different countries in Europe. Due to these barriers to entry the utility companies in cross-border M&A are unable to reap any possible synergy from M&A. This point has also been raised by Campa and Hernando (2004) in the context of M&A of European companies in non-regulated industries.

However in the 3 years post merger period there is a revision of this result and the shareholders in cross-border M&A have earned higher returns compared to those in domestic M&A. This is a very significant and distinguishing finding of this thesis. The result possibly implies that as the length of post merger period increases the utility companies in cross-border M&A have overcome the initial barriers to entry in a foreign land. This is evidenced from the negative coefficient of the dummy variable domestic (DOM) in the regression of the 3 years post merger *BHAR*. In fact in the context of M&A of European utility sectors, Loredó and Suarez (2000) pointed out that the small size of many European markets will prevent the generation of synergy

for domestic mergers that might evolve in cross-border mergers. In addition Goergen and Renneboog (2004) suggested in the context of M&A in non-regulated industries that higher returns in cross-border M&A could be attributed to imperfections in the product and capital market. As a result of these imperfections firms under cross-border M&A exercises a competitive advantage over local firms (Kang, 1993; cited in Goergen and Renneboog, 2004). These are the likely factors that resulted in the generation of higher returns for the shareholders under cross-border M&A compared to domestic M&A in the 3 years post merger period.

Moreover the positive coefficient of the dummy variable privatisation for the long run combined firm *BHAR* indicates that shareholder returns are higher for the newly privatised utility sectors. This is a very significant finding of this study in the context of M&A of European utilities. In addition this is the only study that has found that shareholder wealth creations following M&A are affected by the explanatory variable 'privatisation'. This result possibly suggests that post merger integration is better for the newly privatised utility companies in comparison to those companies that were in private sector since their inception. One likely reason for this outcome is that privatisation led to increase in efficiency of the utility companies. This is revealed by the extant literature on the outcomes of privatisation that I have reviewed in Section 2.1 of Chapter 2 (Newbery, 1997; Parker, 1997; Parker, 2003; Florio, 2007). As a result of this increase in efficiency the newly privatised utility companies possibly are more accomplished to the strategy of M&A compared to the ones which are under private control since their inception

Fifth in the context of the motives behind M&A of European utility sectors the presence of synergy motive can be attributed to the regulatory nature of the utility



sectors. Particularly in Section 1.3 of Chapter 1 I have mentioned that M&A in utility sectors not only require the approval of the antitrust authorities but may also require approval of the specific regulators of utilities. So possibly this regulatory scrutiny has prevented companies from engaging in M&A where there were no clear expectations of synergy benefits.

Taken together the empirical results obtained in this thesis provide mixed evidence on the performances of utility sectors following M&A. On one hand the findings suggest that the economic regulation of utilities acted as a good safeguard for these sectors from incurring severe losses from M&A. In addition the presence of the synergy motive behind M&A also implies that effective regulation of M&A of European utilities has prevented mergers that are not motivated by synergy. Therefore from an economic policy perspective this result bears important policy implications as it suggests that M&A in utility sectors should be passed through effective regulatory scrutiny. On the other hand the fact that acquirer shareholders in the short run and the combined shareholders in the long run have suffered losses triggers a negative signal for the investors in utilities. This also has policy implications as it suggests investors should be careful in entering into M&A as this could have a potential detrimental effect upon maintenance of standards of performance and appropriate investment in infrastructure improvement.

The findings of this thesis bear important signals for the investors of utility companies not only in European countries but also for other utility companies across the globe who may intend to pursue the strategy of M&A. Specifically from the perspective of the investors the findings of this thesis suggest that M&A of European utilities is not a promising strategy, in order to generate higher returns. This is because although



presence of synergy motive has been reported but the level of gain is not very high. This point can also be confirmed by the post merger negative returns accrued to the combined firm shareholders. As indicated in the previous paragraph from the perspective of the regulators and policy makers the findings of this thesis suggest that regulators must be more vigilant in evaluating the potential synergy and thereby approval of M&A in utility sectors. This is an important contribution of this thesis given the economic and social welfare consequences attached to utility sectors.

### **7.3 Contribution of this research from the perspective of governance and political economy of regulation**

In addition to the policy implications discussed in Section 7.2 the findings of this thesis may also have significant policy implications both from the perspective of corporate governance and the political economy of regulation.

The findings of my thesis in terms of the presence of the synergy motive behind M&A of European utility sectors have significant implication from a corporate governance perspective. The theory of market contestability suggests that competition brings in a disciplining effect among the firms which in turn generate internal and allocative efficiency. In the context of the market for corporate control, synergy from M&A is generated through market discipline, where the market forces replace weak target management with a more competent acquirer management (Sudarsanam et al, 1996). So the evidence of synergy motive in my thesis suggests that the market for corporate control is proving effective market based governance mechanism in the context of European utility sectors. However further research is required to examine whether there is any relationship between corporate governance and performance of the

European utility sectors following M&A. Particularly future research can be directed to examine whether the factors related to corporate governance like board composition, board size and directors' share ownership had an impact on shareholder wealth creation following M&A of European utility sectors.

The findings of my thesis can also be extended to current debates concerning the political economy of regulation. Vickers and Yarrow (1988, Chapter 4) put presence of asymmetric information as key reason to argue for need of economic regulation. This is because the managers are much better informed about industry conditions than the firms' owners and regulators. Due to this information asymmetry the regulators can only monitor the firms' activities imperfectly (Vickers and Yarrow, 1988, Chapter 4). Market power enjoyed due to natural monopoly conditions and low price elasticity of demand for utilities increases the chances of consumer welfare loss. In the context of such regulatory challenges, any additional information about potential efficiency gains and performance could help mitigate the problem of information asymmetry. The findings of my thesis on shareholder wealth creation following M&A and motives behind M&A provide a key insight into the causes and consequences of M&A in the context of European utility sectors.

Moreover as I have discussed in Chapter 1 the M&A activity requires regulatory approval. In Europe the European Community Merger Regulation is responsible for approving all M&A. In addition the UK has its own M&A regulatory bodies which are the Office of Fair Trade and the Competition Commission. Given the social and economic significance of the utility sectors the regulators of M&A need to be very vigilant to approve M&A in utilities. This is because any consolidation of utilities that may significantly increase market power of the utility companies may be anti-



competitive. This anticompetitive behaviour of the utility companies may in turn be detrimental for the welfare of the consumers. In this context the presence of synergy motive behind M&A of utility sectors may provide the regulators with guidance about whether any prospective M&A meet public interest criteria. However further research is required to understand the different criteria on the basis of which the regulators approve M&A in utility sectors.

#### **7.4 Limitations and issues for future research**

This section discusses the limitations of this thesis and suggests some areas of future research.

First this thesis is based on M&A of European utility sectors and hence the results could be specific to these environments only. Hence one of my agenda for future research is to examine whether M&A in utility sectors has taken place in any other country or countries on such a significant scale and thereby to extend this analysis in the context of M&A of utilities in other countries.

Second this research has examined the M&A of utility sectors from a finance theory perspective. There are alternative perspectives on M&A such as economic and strategic theories behind mergers. Therefore further research can be directed towards an examination of M&A of utility sectors from these alternative perspectives. Earlier extant literature reviewed in Chapter 2 on M&A of European utilities based on strategic perspective is based only on the electric utility sector.



Third in this research I have broadly examined the motives behind M&A of utilities by examining whether these M&A were motivated by synergy, agency or hubris. However each of these three motives could be subdivided further in various subgroups. For instance there are several sources of synergy like operational synergy, financial synergy and managerial synergy (Sudarsanam et al, 1996; Weston et al, 2001). Similarly agency motives could be either due to managerialism motive or free cash flow problem (Weston et al, 2001). Therefore future research on M&A of utilities can be directed to examine the precise source of synergy or agency motives behind M&A in utility sectors.

Fourth another area of future research that I wish to pursue is to extend the analysis of determinants of shareholder returns following M&A by including some more explanatory variables such as method of payment (cash versus stock) and mode of acquisition (hostile or friendly).

Fifth this study can be further extended to study the issues of corporate governance like managerial compensation in the context of M&A of utility sectors.

Despite these limitations of this thesis it is the first piece of empirical research that has examined the M&A of regulated industries specifically M&A of utilities by European acquirers. Drawing upon traditional methods used in finance literature to analyse M&A this thesis has applied these methods in the context of M&A in the utility sectors. This study therefore has contributed both to the study on utility sectors as well as in the field of finance literature on M&A.

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